

Vadim Kimmelman

INFORMATION STRUCTURE

in Russian Sign Language
and Sign Language of the Netherlands



This dissertation explores Information Structure in two sign languages: Sign Language of the Netherlands and Russian Sign Language. We study the expression of Information Structure, investigate the similarities and differences between the two languages, and discuss the data within a typological framework; in addition, we assess the modality effects in this domain.

V. Kimmelman Information Structure in RSL and NGT

INFORMATION STRUCTURE
IN RUSSIAN SIGN LANGUAGE
AND SIGN LANGUAGE OF THE NETHERLANDS



UNIVERSITY OF AMSTERDAM

Amsterdam Center for Language and Communication

Research funded by



Netherlands Organisation for Scientific Research

Printed by CPI-Wöhrmann Print Service – Zutphen

Cover illustration and design: © 2014 by Alisa Rysaeva (www.saali.nl)

Copyright © 2014 Vadim Kimmelman: all rights reserved

INFORMATION STRUCTURE IN RUSSIAN SIGN LANGUAGE
AND SIGN LANGUAGE OF THE NETHERLANDS

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor

aan de Universiteit van Amsterdam

op gezag van de Rector Magnificus

prof. dr. D. C. van den Boom

ten overstaan van een door het college voor promoties ingestelde

commissie, in het openbaar te verdedigen in de Agnietenkapel

op vrijdag 14 november 2014, te 10.00 uur

door Vadim Kimmelman

geboren te Omsk, Rusland

Promotor: Prof. dr. A.E. Baker

Copromotor: Dr. R. Pfau

Overige leden: Prof. dr. D.C. Lillo-Martin

Prof. dr. M. Zimmermann

Prof. dr. M. Steinbach

Prof. dr. E.O. Aboh

Prof. dr. P.C. Hengeveld

Faculteit: Faculteit der Geesteswetenschappen

Table of contents

Table of contents	i
List of figures	viii
List of tables	x
Glossing conventions	xii
List of sign languages and abbreviations.....	xiv
Acknowledgments	xv
1. Introduction.....	1
1.1 Sign language linguistics.....	1
1.1.1 Why study sign languages?	1
1.1.2 Some properties of sign languages	2
1.2 Sign languages: typology and modality	5
1.2.1 Comparison of sign languages.....	5
1.2.2 Sign languages and typology	6
1.2.3 Modality differences and modality effects	7
1.3 Background information on RSL and NGT	7
1.3.1 Sign Language of the Netherlands.....	8
1.3.2 Russian Sign Language.....	9
1.3.3 Comparison between RSL and NGT.....	9
1.4 Notions of Information Structure.....	10
1.4.1 Information Structure.....	11
1.4.2 Topic	11
1.4.3 Focus.....	14
1.5 General research questions.....	17
1.6 Structure of the dissertation	18
2. Previous research.....	20
2.1 Introduction.....	20
2.2 Topic	20
2.2.1 Semantics of topics.....	21
2.2.2 Syntax of topics	22

2.2.3 Non-manual marking.....	24
2.2.4 Topic prominence.....	25
2.2.5 Research questions	26
2.3 Focus.....	27
2.3.1 Types of focus.....	27
2.3.1.1 Information focus.....	27
2.3.1.2 Contrastive focus	28
2.3.1.3 Emphatic focus.....	29
2.3.2 Prosodic/stress marking	29
2.3.3 Non-manual marking.....	30
2.3.4 Contrast in space	31
2.3.5 Research questions	32
2.4 Doubling	32
2.4.1 Doubling as a morphosyntactic strategy.....	33
2.4.2 Doubling and Information Structure	34
2.4.3 Research questions	36
2.5 Weak hand holds.....	36
2.5.1 Form and function of weak hand holds.....	37
2.5.2 Weak hand holds and Information Structure.....	39
2.5.3 Unresolved issues.....	39
2.5.4 Research questions	40
2.6 Summary.....	41
3. Topic.....	42
3.1 Introduction.....	42
3.2 Methodology	43
3.2.1 Data collection.....	43
3.2.3 Participants.....	43
3.2.3 Identifying topics	45
3.3 Topics and topic marking.....	46
3.3.1 Syntactic markers	47
3.3.1.1 Word order	48
3.3.1.2 Topic copying	49
3.3.1.3 The IX + topic strategy	50
3.3.1.4 Simultaneous marking	51
3.3.1.5 PALMS-UP as a topic marker.....	52
3.3.2 Non-manual markers.....	53

3.3.2.1 Functions of eyebrow movement in RSL and NGT.....	53
3.3.2.2 Eyebrow movement for topic marking.....	57
3.3.2.3 Head tilts as topic markers.....	59
3.3.2.4 Phonetic differences between RSL and NGT in non-manual marking.....	60
3.3.3 Prosodic boundaries.....	61
3.3.3.1 Prosodic boundaries and non-manuals.....	61
3.3.3.2 Role shift and prosodic boundaries.....	62
3.3.3.3 Prosodic boundaries without role shift.....	64
3.3.4 Optionality of aboutness topic marking.....	65
3.3.5 Non-prototypical topics.....	66
3.4. Topic shift.....	67
3.4.1 Definition and challenges.....	68
3.4.2 Topic shift in RSL and NGT.....	69
3.4.3 Topic shift with zero expression.....	71
3.4.4 Differences between cartoon retellings and personal stories.....	71
3.4.5 Topic shift and non-manual marking.....	72
3.5 Thetic sentences.....	73
3.6 Topic prominence.....	74
3.6.1 Topic prominence in sign languages.....	75
3.6.2 Topic prominence in RSL and NGT.....	76
3.7 Summary.....	77
4. Focus.....	79
4.1 Introduction.....	79
4.2 Methodology.....	79
4.2.1 Participants.....	79
4.2.2 Elicitation material.....	82
4.2.3 Elicitation procedure.....	85
4.2.4 Analysis.....	86
4.2.4.1 Rethinking types of movement.....	86
4.2.4.2 Syntactic markers.....	88
4.2.4.3 Manual prosodic markers.....	89
4.2.4.4 Non-manual markers.....	91
4.2.4.5 Analysis of interactions of syntax, manual prosody, and non-manuals.....	93
4.2.4.6 Analysis of QUIS test items.....	93
4.2.4.7 Reliability of analysis.....	94
4.3 Syntactic marking of focus.....	94
4.3.1 Fronting.....	95
4.3.2 VO vs. OV.....	95

4.3.3 Doubling	97
4.3.4 Focus particles	99
4.3.5 Ellipsis	100
4.3.6 Summary	103
4.4 Manual prosodic markers of focus	104
4.4.1 Length	104
4.4.2 Repetition	106
4.4.3 Speed	108
4.4.4 Size	108
4.4.5 Height	111
4.4.6 VP and sentence focus	112
4.4.7 Summary	113
4.5 Non-manual markers of focus	114
4.5.1 Eyebrow raise	114
4.5.2 Head tilt	115
4.5.3 Body lean	116
4.5.4 Head nods	116
4.5.5 Mouthing	118
4.5.6 Eye gaze	119
4.5.7 VP and sentence focus	121
4.5.8 Summary	122
4.6 Interaction of syntactic, prosodic, and non-manual markers	123
4.7 Marking contrast	124
4.8 Discussion	127
4.8.1 Focus types and marking	127
4.8.2 Focus projection	128
4.8.3 Comparison of RSL and NGT	129
4.8.4 Modality effects	130
5. Doubling	132
5.1 Introduction	132
5.2 Methodology	133
5.2.1 Data collection	133

5.2.2 Participants.....	133
5.2.3 Defining doubling	135
5.3 Data	136
5.3.1 The X X pattern: hesitation.....	137
5.3.2 The X X' pattern of doubling: clarification.....	137
5.3.3 The X Y X(') pattern of doubling	138
5.3.3.1 Clause-internal doubling	139
5.3.3.2 Clause doubling.....	141
5.3.3.3 Differences in distribution between RSL and NGT	142
5.3.4 Identical and modified copies	142
5.3.4.1 Identical doubling	142
5.3.4.2 Modified doubling.....	143
5.3.4.3 Phonetic differences	145
5.3.4 Prosody of doubling	146
5.3.5 Summary	148
5.4 Functions of doubling	148
5.4.1 Morphosyntactic motivation.....	149
5.4.2 Emphasis and doubling.....	150
5.4.3 Pragmatic explanation.....	150
5.4.3.1 The one new idea constraint.....	151
5.4.3.2 Foregrounding and backgrounding	151
5.4.3.3 Clause doubling and grammaticalization	153
5.4.3.4 Problematic cases	155
5.5 Discussion	157
5.5.1 Notional consequences	157
5.5.2 Prosody and doubling.....	157
5.5.3 Why is doubling so prominent?	158
5.5.3.1 Sociolinguistic motivation for doubling	159
5.5.3.2 Cognitive motivation for doubling	160
5.6 Conclusions.....	160
6. Weak hand holds	162
6.1 Introduction.....	162
6.2 Methodology	163
6.2.1 Data	163
6.2.1.1 Sign Language of the Netherlands	163
6.2.1.2 Russian Sign Language	163
6.2.2 Participants.....	164
6.2.3 Annotation.....	165
6.2.3.1 Pre-existing annotations	165

6.2.3.2 Annotations created for the present study	166
6.3 Functions of holds	167
6.3.1 Phonetic holds	167
6.3.2 Marking a syntactic domain	169
6.3.3 Iconic functions	172
6.3.4 Discourse-related functions	174
6.3.5 Form-function relations.....	177
6.3.6 Summary: form and function of weak hand holds.....	178
6.4 Frequency and distribution of hold types	178
6.4.1 Overall frequency of weak hand holds.....	179
6.4.1.1 Cross-linguistic differences	180
6.4.1.2 Genre differences	182
6.4.2 Phonetic characteristics	183
6.4.2.1 Length	183
6.4.2.2 Handedness of the source sign	185
6.4.2.3 Progressive-regressive spreading	187
6.4.2.4 Right boundary.....	187
6.4.3 Summary	188
6.5 Discussion	188
6.5.1 Weak hand holds and Information Structure.....	188
6.5.2 Differences between genres and languages	189
6.5.3 Form and function	190
6.5.4 Modality effects.....	191
6.6 A sidestep: a syntactic account of weak hand holds.....	192
6.6.1 The linearization problem	192
6.6.2 Multidominance in spoken languages.....	194
6.6.3 Multidominance and weak hand holds.....	197
6.6.3.1 Syntax of weak hand holds	197
6.6.3.2 Linearization of holds.....	198
6.6.3.3 Multi-rooted structures	200
6.6.3.4 Parentheticals	201
6.6.4 Discussion	203
7. Discussion and conclusions.....	205
7.1 Summary of the empirical results	205
7.1.1 Topics.....	205
7.1.2 Focus and foregrounding.....	208
7.1.3 Other results of the project.....	210

7.2 Intra-modal typology: comparison between RSL and NGT	210
7.2.1 Topic marking	211
7.2.2 Focus marking.....	211
7.2.3 Doubling	212
7.2.4 Weak hand.....	213
7.2.5 How different are RSL and NGT?	213
7.3 Cross-modal typology	214
7.3.1 Topics in typological perspective	214
7.3.1.1 General properties of topic marking	214
7.3.1.2 Topic prominence	216
7.3.2 Focus in typological perspective	217
7.3.2.1 General properties of focus marking	217
7.3.2.2 Focus vs. contrast.....	219
7.3.3 Doubling in typological perspective	220
7.4 Modality effects.....	221
7.4.1 Prosody and modality.....	222
7.4.2 Gesture and sign languages.....	223
7.4.2.1 Weak hand holds	223
7.4.2.2 Contrastive use of space	225
7.4.2.3 Eyebrow raise and head nod.....	226
7.4.3 Is doubling special?	226
7.4.4 Wh-clefts	227
7.5 Future research directions	229
7.5.1 Methodological issues.....	229
7.5.2 Related topics.....	230
7.5.3 Gesture vs. sign	230
Appendix A1. Stimuli	232
Appendix A2. Testing reliability of coding for manual prosodic markers	237
References	241
Summary	254
Samenvatting	258
Краткое содержание.....	263

List of figures

Figure 3.1. Captions of the verb CL:CLIMB.UP	55
Figure 3.2. ‘You know’ expression in RSL and NGT	56
Figure 3.3. Different degrees of eyebrow raise in NGT	59
Figure 3.4. Backward head tilt in RSL (a) and NGT (b)	60
Figure 3.5. Small eyebrow raise on a topic in RSL.....	61
Figure 4.1. Picture used to elicit focus, followed by question in (2), taken from Skopeteas et al. (2006).	82
Figure 4.2. Hand-internal movement in the NGT sign MAN (first and last frame).	87
Figure 4.3. Small path movement in the RSL sign GIRL (first, middle and last frame; in the second frame, the hand touches the chin).	87
Figure 4.4. Normal path movement in NGT sign PUSH (first, middle and last frame).	87
Figure 4.5. Proportion of focus-only sentences across types of focus (a) and syntactic roles (b) in RSL. The differences are not significant. IF – information focus; Sel – selective focus; Corr – corrective focus.	101
Figure 4.6. Proportion of focus-only sentences across focus types (a) and syntactic roles (b) in NGT. The difference between corrective and the other two types of focus is significant. IF – information focus; Sel – selective focus; Corr – corrective focus.	102
Figure 4.7. a) Proportions of signs which are longer in focus across focus types in NGT. Difference between IF and (Sel and Corr) is significant. b) Proportions of signs which are longer in focus across types of movement in NGT. Difference between (HI and SP) and P is significant. IF – information focus; Sel – selective focus; Corr – corrective focus. HI – hand internal; SP – small path; P – normal path.	105
Figure 4.8. Proportions of signs with more repetitions when focused compared to non-focused versions of the same signs across movement types in RSL, the difference between P and (HI and SP) is highly significant. HI – hand internal; SP – small path; P – normal path.	106
Figure 4.9. Proportion of signs which are slower in focus across types of movement in NGT. Difference between P and other types is significant. HI – hand internal; P – normal path; SP – small path.	108
Figure 4.10. a) Size marking across focus types in RSL. Differences between IF and (Sel and Corr) are significant. b) Size marking across types of movement in RSL. Differences between P and (SP and HI) are significant. IF – information focus; Sel – selective focus; Corr – corrective focus. HI – hand-internal; P – path; SP – small path.	109
Figure 4.11. Proportions of signs which are larger when in focus across movement types in NGT. All differences are significant. HI – hand-internal; P – path; SP – small path.	110
Figure 4.12. NGT sign WOMAN marked by larger size of movement in focus in comparison to the non-focused counterpart. a) The first frame of the sign in focus. b) The first frame of the sign not in focus. The movement in both versions consists of the index finger touching the thumb.	110
Figure 4.13. a) Marking by higher location across types of focus in RSL. Difference between IF and (Sel and Corr) is significant. b) Marking by higher location across types of movement in RSL. Differences between HI and (SP and P) are significant. IF – information focus; Sel – selective focus; Corr – corrective focus. HI – hand-internal; P – path; SP – small path.	111

Figure 4.14. Proportion of focused signs with backward head tilt across syntactic roles in NGT. Difference between object focus and the other types is significant.	115
Figure 4.15. a) Proportion of focused signs marked by head nods across types of focus in NGT. Differences between information focus (IF) and other types of focus (selective (Sel) and corrective (Corr)) are highly significant. b) Proportion of focused signs marked by head nods across syntactic roles in NGT. Differences between subject focus and other syntactic roles are highly significant.	118
Figure 4.16. Rightward (a) and leftward (b) body lean in RSL, from example (28).....	125
Figure 5.1 Two occurrences of CL:PUT in example (25).....	144
Figure 5.2. Occurrences of the sign CHAT in (29)	146
Figure 5.3. Fore- and backgrounding	161
Figure 6.1 Snapshot of an ELAN annotation of an NGT text with each hand glossed separately.	166
Figure 6.2. Mean weak hand holds rate for RSL and NGT narratives. Error bars represent 95% confidence interval.....	181
Figure 6.3. Distribution of weak hand hold in RSL and NGT narratives. The observed differences are not statistically significant.....	182
Figure 6.4. Distribution of weak hand holds in NGT narratives and conversations.....	183
Figure 6.5. Number of sentences simultaneous with a hold in both languages combined.....	185
Figure 6.6. Handedness in weak hand holds and in non-overlapping signs	186
Figure 6.7. Handedness of different types of weak hand holds	187
Figure 7.1. Possible typological classification I: Topic-copying in sign languages.....	214
Figure 7.2. Possible typological classification II: Non-manual markers of focus in sign languages	214
Figure 7.3. Possible typological classification III: A scale of topic prominence in spoken and sign languages.....	217
Figure A1.1. Pictures from QUIS used to elicit contrast. In the first pair of pictures the dog and the cat are expected to be contrasted topics, and the boy and the girl – contrastive foci. In the second pair the opposite relation is expected. In the third pair the man and the woman are expected to be contrastive topics, and the bike and the horse – contrastive foci. In the fourth pair the opposite relation is expected.	237

List of tables

Table 3.1. Characteristics of NGT signers participating in the study	44
Table 3.2. Characteristics of RSL signers participating in the study.....	44
Table 3.3. Prototypical topics in RSL and NGT	47
Table 3.4. Eyebrow movements in RSL and NGT	54
Table 3.5. Marked and unmarked aboutness topics.....	65
Table 3.6. Overtiness of topics with topic shift in NGT	69
Table 3.7. Overtiness of topics without topic shift in NGT	70
Table 3.8. Overtiness of topics with topic shift in RSL	70
Table 3.9. Overtiness of topics without topic shift in RSL	70
Table 4.1. Sociolinguistic characteristics of NGT signers.	80
Table 4.2. Sociolinguistic characteristics of RSL signers.....	81
Table 4.3. Combinations of factors in RSL and NGT represented by two test items in the final design. Each cell provides focus type, focus scope, and movement type (HI – hand-internal, P – path).....	84
Table 4.4. The battery of test items for RSL and NGT classified by functions	85
Table 4.5. Prosodic markers in RSL and NGT. The column focused > non-focused contains the numbers (and percentages in brackets) of signs for which focused versions were longer/slower/larger/higher/ contained more repetitions than their non-focused counterparts. The column non-focused > focused reflects the opposite situation.....	91
Table 4.6. VO and OV order in RSL and NGT across different focus scopes. The differences between focus scopes with respect to word order are not significant in either language.....	96
Table 4.7. Individual signs (in focus) never marked by repetition in RSL and NGT.....	107
Table 4.8. Mouthing in sentences with focused and non-focused signs in RSL and NGT across syntactic roles in sentences with non-focused material present.	119
Table 4.9. Eyegaze in sentences with focused and non-focused signs in NGT across syntactic roles.	120
Table 4.10. Eye gaze in sentences with focused and non-focused material in RSL across syntactic roles	120
Table 4.11. Differences in focus markers between types of focus in RSL and NGT. Grey cells imply that they are similar with respect to this marker; the differences are indicated in non-highlighted cells.	128
Table 4.12. Differences in focus marking between RSL and NGT in syntactic, manual prosodic, and non-manual domains	130
Table 5.1. Characteristics of NGT signers.....	134
Table 5.2. Characteristics of RSL signers.....	134
Table 5.3. Instances of doubling in the RSL and NGT data	136
Table 5.4. Different subtypes of the X Y X(') pattern in RSL and NGT retellings of Canary Row	142
Table 5.5. Patterns of doubling in RSL and NGT in raw numbers and percentages	148
Table 5.6. Grammaticalization of doubling.....	154
Table 6.1. Summary of the data set. Number of signs is an approximation based on preferred hand glosses.	163
Table 6.2. Characteristics of NGT signers participating in the study	164

Table 6.3. Characteristics of RSL signers participating in the study.....	165
Table 6.4. Number of weak hand holds across genres in RSL and NGT.....	167
Table 6.5. Forms and functions of holds in RSL and NGT	178
Table 6.6. Number of weak hand holds across genres	179
Table 6.7. Proportion of holds belonging to a single type category or two categories and the total percentage of holds assigned each type. The percentages in the first four columns add up to 98%, as the 2% of holds belonging to three or four types are not represented. The figures in the last column show the percentage of holds assigned a type, regardless of the overlaps between the categories – as a result these percentages do not add up to 100% (622 holds).	179
Table 6.8. Rate of weak hand holds (average number of holds per 100 glosses).....	180
Table 6.9. Distribution of holds in narratives.....	182
Table 6.10. Descriptive statistics of weak hand holds in narratives and conversation in NGT.....	183
Table 6.11. Distribution of weak hand holds in narratives and discussions in NGT	183
Table 6.12. Number of overlapping glosses in weak hand holds in RSL and NGT	184
Table 6.13. Length of different types of weak hand holds	184
Table 6.14. Number of weak hand holds across sentences in RSL and NGT narratives	184
Table 6.15. Length of different types of weak hand holds in overlapping sentences	185
Table 6.16. Handedness of different types of weak hand holds	186
Table 7.1. Differences in focus marking between RSL and NGT.	212
Table A1.1. Test items for which answers are analyzed (see section 4.2).....	232
Table A1.2. Test items for which only questions have been used.....	234
Table A1.3. Signs in RSL and NGT: movement types.	235
Table A2.1. Agreement assessment (Cohen’s kappa).....	238
Table A2.2. Coefficients for weighted kappas.	239

Glossing conventions

The main principle of glossing used in this dissertation is that only the information crucial for the interpretation of the example is provided. For instance, if non-manuals are not relevant to the illustrated phenomenon, they are not marked. The same is true for prosodic boundaries, and the activity of the second hand. This decision was taken for the sake of clarity and space. In addition, the interested reader can get access to the whole original database and view all the examples.¹ Glosses in SMALL.CAPS are approximate translation of signs.

Gloss	Explanation
LOWER.BINOCULARS	If two English words are used to gloss one sign, the words are separated by a dot: LOWER.BINOCULARS.
C-A-T	Fingerspelling is glossed with dashes between the letters.
CL:GO	Classifier predicate meaning ‘go’
IX	Index (pointing sign)
-1, -2	First- and second-person markers on pronouns and agreeing verbs.
-a, -b	-a and -b are used if more than one 3 rd person referent is used in the sentence. Otherwise, 3 rd person pronouns are glossed as IX.
-POSS	Possessive marker
-REC	Reciprocal agreement
-ASP.CONT/DISTR	Continuous aspect marking, distributive marking
top	Aboutness topic
sst	Scene-setting topic
foc	Focus
@	Gesture
PU	PALMS-UP sign
/	Prosodic boundary
#	Hesitation
~	Speech error
dm	Discourse marker
h1, h2	First/second hand, when hands are glossed separately

Non-manual markers are given above the glossing line, the length of the underline reflecting the scope of the non-manual marker.

Gloss	Explanation
rht	Rightward head tilt
lht	Leftward head tilt
bht	Backward head tilt
dht	Downward head tilt
rbl	Rightward body lean

¹ For the files contact the author at vadim.kimmelman@gmail.com.

lfl	Leftward body lean
fbl	Forward body lean
bbl	Backward body lean
ln	large head nod
sn	Small head nod
er	Eyebrows raised
ef	Eyebrows furrowed

Additional non-manual markers are used in examples from other sign languages:

Gloss	Explanation
hs	Headshake
neg	Marker of negation
top	Marker of topic
nod	Head nod
t-c	Marking of topic in topic-comment structure
I-foc	Information focus
ew	Eyes wide open
bl	Eye blink

Examples are provided with the label of the language they come from. For examples from other sources, only the name of the languages or the sign language acronym (see next page) is provided. However, for examples from our RSL and NGT data, a code is provided which contains information on the particular video-file and the signer.

For instance, NGT-94-1 refers to the file 94 from Corpus NGT and to the signer 1 from this corpus. In the case of RSL, the file name also specifies the type of discourse: for instance, s2 refers to the second personal experience story, while cr4 refers to the fourth Canary Row cartoon retelling. That is, the code RSL-s2-12 refers to the text s2 by signer 12 from corpus RSL. These labels are used in chapters 3, 5 and 6. In chapter 4, a slightly different system is used. The labelling of these examples is organized as follows: RSLf/NGTf refers to the language and to the fact that these examples come from the focus elicitation study and not from corpora of RSL and NGT. This is followed by the number of the test item (-1-), referring to the numeration provided in Appendix A1. The last number refers to the signer, as numbered in tables 4.1 and 4.2. In the case of RSL, signers partially overlap with the signers who participated in the creation of the corpora used in chapters 3, 5, and 6. In the case of NGT, there is no overlap of signers with the ones who participated in the corpus, so to emphasize this fact the numbers referring to NGT signers in this chapter are accompanied by f: f1, f2, etc.

List of sign languages and abbreviations

This list contains all sign languages mentioned in this dissertation. The abbreviations stated here are the ones mostly commonly used in the literature. Sometimes the abbreviation is based on the English name of the languages, as in the case of Russian Sign Language, and sometimes it is based on the local name, such as in the case of Sign Language of the Netherlands (Nederlandse Gebarentaal, NGT). *n.a.* means that no abbreviation is used in the dissertation.

Language	Abbreviation
Adamorobe Sign Language	n.a.
American Sign Language	ASL
Australian Sign Language	Auslan
Austrian Sign Language	n.a.
Brazilian Sign Language	LSB
British Sign Language	n.a.
Catalan Sign Language	LSC
Croatian Sign Language	n.a.
Danish Sign Language	n.a.
Finnish Sign Language	FSL
French Sign Language	n.a.
German Sign Language	DGS
Hong Kong Sign Language	HKSL
Israeli Sign Language	ISL
Italian Sign Language	n.a.
Jamaican Sign Language	n.a.
Jordanian Sign Language	LIU
Quebec Sign Language	LSQ
Polish Sign Language	n.a.
Russian Sign Language	RSL
Sign Language of the Netherlands	NGT
Swedish Sign Language	SSL

Acknowledgments

Four years is a long time to write something, although this is how long it usually takes to write a dissertation. Many things have happened during this time, and there are many people who I met and who have helped me during this project, so it is a very pleasant task to finally thank them all.

Firstly, I want to thank my supervisors: Roland Pfau and Anne Baker. I have met Roland in 2008 when I started my MA at the University of Amsterdam, and I took his courses on sign linguistics, which was fun, and then he encouraged me to write a paper, and then he was also very encouraging when I said that I would probably want to do a PhD. And from the very first day when I came to Amsterdam in 2010 to actually write the dissertation, he was very supportive, and always ready to help – with any questions or concerns, not only work-related. I learned a lot: this dissertation is much better than it would have been without Roland's meticulous feedback and various help. And I also enjoyed our collaboration, discussions, and occasional dinners. I was very lucky to have such a supervisor. Thank you, Roland!

Quite often (I heard) the main supervisor (=promotor) in the Netherlands does not actively participate in the life of a PhD student. However, this is absolutely not the case with Anne Baker, who was involved in my project at all stages. I could always come to Anne with questions, and I could always expect to receive a very detailed, thorough, and timely feedback from her. Apart from working on the thesis, I was teaching quite a lot, and here again Anne's help was huge: being a very experienced teacher, she gave me excellent advice, and in a tactful way, so that I wouldn't feel overwhelmed. Again, I learned a lot: in the domain of research, writing, teaching, and other things. It was great to have Anne as a supervisor. Thank you, Anne!

Next I would like to thank the people with whom I actively collaborated on one or several of the subprojects within my PhD. Roland Pfau has to receive my thanks again, as we worked together on an overview of research on Information Structure in sign languages. Another collaborator of two years is Anna Sáfár: I think we both benefited from our joint work on the weak hand holds. Anna Anatolievna Komarova and Tatiana Panteleevna Davidenko are much more than just collaborators: without them I would never be able to collect all the RSL data – and I think that our joint project on focus in RSL is very interesting! The same can be said about Yassine Nauta, with whom I worked on focus in NGT: her help was invaluable, and I hope we continue to work on this project in the near future.

Of course, nothing would be possible without the help and collaboration of RSL and NGT signers: thanks to you all! I appreciate that you were willing to share your language with me. And I am also very grateful to people who helped me learn RSL and NGT: Vera Ezhova, Tatiana Davidenko, Marijke Scheffener, Joni Oyserman, Tom Uittenbogert, and Marte Bol Raap. Apart from the signers who taught me sign languages, several people were encouraging me when I was making first steps in sign linguistics in Moscow, so I want to thank them as well: Anna Anatolievna Komarova, Aleksandr Vasilievich Komsukov, Valentina Petrovna Kamneva, Pavel Sergeevich Troshinkin, thank you!

A separate word of thanks should go to the people who taught me linguistics in Moscow. I am grateful to Andrei Aleksandrovich Kibrik who supervised my term papers and my thesis at Russian State University for the Humanities, to Vera Isaakovna Podlesskaja, Nina Romanovna Sumbatova, and Tatiana Evgenievna Janko, from whom I learned how interesting Information Structure is, and to Barbara Partee, who taught me much more than just formal semantics, and was always ready to help.

I am also grateful to other researchers working on RSL with whom I had productive discussions and from whom I received various help: Olga Drozdenko, Svetlana Igorevna Burkova, Daria Borodulina, and Elena Gromova. Other researchers who provided help and feedback for some parts of the project are Gemma Barberá, Pavel Rudnev, Inge Zwitterlood, and Onno Crasborn.

I would also like to thank my office mates Katja Bobyleva, Sterre Leufkens, Mark Schmalz, and Tessa Spätgens, for the discussions, lunches, and the general atmosphere. In addition, I enjoyed the company of my other Amsterdam colleagues, primarily fellow PhD students, thanks to you all, guys! Bibi Janssen and Iris Duinmeijer helped me with the summary in Dutch, thanks a lot! And a special thanks to Dirk-Jan Vet for his technical help.

In 2013 I was very lucky to spend two months at the University of Connecticut, where I immensely enjoyed the company of researchers working on sign linguistics: Diane Lillo-Martin (thank you for all the feedback and the time you took to read and discuss my stuff), Marie Coppola, Kathryn Davidson, Emily Carrigan, Deanne Gagne, Vanessa Petroj, Harry van der Hulst, Jon Gajewski, and Kazumi Matsuoka.

I thank the members of the scientific committee who have taken their time to read and evaluate my dissertation, and to come to the defense: Diane Lillo-Martin, Markus Steinbach, Malte Zimmermann, Kees Hengeveld, and Enoch Aboh. Also thanks to Tessa Spätgens and Thomas Leopold for agreeing to be my paranimfen.

Thanks to Alisa Rysaeva for designing the cover for this book, the invitation, and the banner! Among other things.

Now here people usually thank their family, but my thanks to them are too long for this short text, so I will thank them personally!

1. Introduction

It is often said that language is a communication tool. Essential to the use of this communication tool is the exchange of information. Conversation partners function in a context and in that context they manage the information exchange. Consider the sentence: “**Alisa** flew to Moscow.” The word *Alisa* receives stress and in English stress often indicates that this is the new information that the partner should attend to. Languages use many and varied means to indicate what is new or old information; word stress is but one example. Information Structure (IS) is a theory that tries to describe and explain how this information exchange is managed (see for example Krifka 2008 and Zimmermann and Onea 2011 for an overview).

Of course, the abovementioned sentence could also be uttered in a sign language. The signers also exchange information, and make use of the context and linguistic means to instruct each other concerning the interpretation of the information. The question is whether, given the different channel of information transmission – the visual modality – they would use different strategies to code and decode information.

The dissertation will explore this question through the study of IS in two unrelated sign languages: Sign Language of the Netherlands (*Nederlandse Gebarentaal*, in the following abbreviated as NGT) and Russian Sign Language (RSL). This is a new contribution to sign language typology since these two languages have not been compared before in the area of IS. It also for the first time goes deeply into the forms and functions used in IS in these two sign languages in the search for possible universal and modality specific aspects. Finally this dissertation is based on corpora and involves quantitative and qualitative descriptions, which is quite unusual in the field of sign linguistics.

The purpose of this first chapter is to formulate the research questions. However, in order to do that, we need to introduce several components of the study. We start by introducing the field of sign linguistics (section 1.1), which in the last 50 years has become an intrinsic part of the discipline of linguistics, and by providing a brief overview of some important properties of sign languages. In section 1.2 we discuss the typological and theoretical impact of studying sign languages. After that we introduce the languages analyzed in the present study in section 1.3. Section 1.4 discusses briefly the main notions of IS. This discussion will allow us to formulate the research questions in section 1.5. Finally, section 1.6 sketches the structure of the dissertation.

1.1 Sign language linguistics

1.1.1 Why study sign languages?

At present, it is unknown how old sign languages are. For some sign languages, a history of at least 200 years has been documented, but there are also scholars who argue that sign languages were used 500 or even 2,000 years ago as well (McBurney 2012). However, they only became an object of systematic linguistic investigation in the 1960s, following the publication of the seminal work by Stokoe (1960) on the sublexical structure of American Sign Language (ASL). Once the first studies devoted to the linguistic description of sign languages (at this time, primarily ASL) had appeared, more and more psycholinguists,

theoretical linguists, sociolinguists and typologists got excited about this addition to the research agenda and initiated studies on an increasing number of sign languages (see Pfau, Steinbach and Woll 2012 to get an up-to-date picture of the wide range of topics in sign linguistics).

Nowadays, it is a commonly accepted fact – at least within linguistic circles – that sign languages are natural languages; nevertheless, only few sign languages have been studied comprehensively by linguists. To this day, most research has been conducted on ASL: its phonology, morphology and syntax have been described in quite some detail (see Sandler and Lillo-Martin 2006 for an overview); numerous psycholinguistic experiments have been conducted (starting from Bellugi and Klima 1979; also see Emmorey 2001); sociolinguistic variation has been studied (Lucas, Bayley and Valli 2001). Sign Language of the Netherlands, which we introduce in section 1.3.1, has also been relatively well studied, although the number of available studies cannot be compared with the number of studies on ASL. However, many sign languages, including Russian Sign Language, have barely undergone any linguistic analysis (see section 1.3.2 for an overview).

Why is it important to study sign languages? First of all, for the same reasons it is important to study spoken languages. In order to understand the human language capacity, to make both typological generalization and to develop theoretical models of language, cross-linguistic data are indispensable. It is therefore necessary to describe and analyze as many languages as possible, including sign languages. But there is also an additional reason that makes sign languages an important object of study. Crucially, sign languages function in a different modality of signal production and perception, namely, they are visual-spatial, which means that they allow the linguist to scrutinize the interplay between the general (i.e. modality-independent) principles of the language capacity and the limitations and possibilities of different modalities. We discuss these issues in greater detail in section 1.2.

In this dissertation, we attempt to contribute to all of the objectives of sign linguistics mentioned above. In particular, we will describe some aspects of IS, namely topic and focus marking, in two sign languages. In addition, we will discuss the results in typological and theoretical perspective whenever possible. Finally, we will assess the influence of the visual-spatial modality in this domain.

Before we proceed to the discussion of Russian Sign Language and Sign Language of the Netherlands, it is necessary to introduce some basic linguistic properties of sign languages which are crucial as a background for understanding the examples in the remainder of the dissertation.

1.1.2 Some properties of sign languages

Despite the fact that sign languages exist in a different modality, they are similar to spoken languages with respect to many core properties. In particular, sign languages have been claimed to display systematic grammatical structure at all levels of linguistic description: phonetics, phonology, morphology, and syntax. Phonetics² is concerned with articulatory properties of signs (Crasborn 2001), while phonology is concerned with the sublexical components that signs are built from, such as handshape, orientation, location and movement (Sandler 1989, Brentari 1998, van der Kooij 2002). Morphology is concerned with meaningful units and processes which operate at the word-level (Meir 2012). Thus, sign

² The original meaning of the words *phonetics* and *phonology* are somewhat misleading when applied to sign languages, as sign languages do not operate with sounds. In fact, for this reason, Stokoe proposed the term *cherology*. However, nowadays these terms are often used to emphasize the structural similarities on these levels between signed and spoken languages.

Note also, that with respect to negation, Zeshan (2004) claimed that sign languages can be divided into non-manually- and manually dominant, that is, some sign languages can express negation with the help of a non-manual marker only, while in others a manual negative sign is required.

As for prosodic markers, in example (4) from Hong Kong Sign Language (HKSL), the eye blink marks a prosodic boundary (adapted from Sze 2008, cited by Pfau and Quer 2010: 401). In particular, it marks the right boundary of a conditional sentence, which constitutes an Intonational Phrase.

- (4) bl SUBSIDY HAVE, RESTRICT-ONE'S-FREEDOM [HKSL]
'If you receive subsidy (from government), your freedom will be restricted.'

Another non-manual marker is body shift: it involves the whole body of the signer and is often described as marking role shift (also referred to as reference shift, constructed action, etc. (Lillo-Martin 2012)). The function of this marker is for the signer to take on the role of one of the characters in the story. This function is realized as a body shift to one side, but it also commonly involves the use of facial expressions which the character would have used, and acting from the character's point of view. In addition, indexical elements, such as pronouns, shift their reference, so that for instance a first person pronoun used within the role shift refers to the character, and not the signer, as is illustrated in example (5) from Catalan Sign Language (LSC, adapted from Pfau and Quer 2010:396), where the signer shifts his body towards the location of the referent ANNA in order to take her role and report her speech. Note that the first person pronoun IX-1 used within the role shift is interpreted as referring to Anna and not to the signer. In this example, role shift is used to report speech of a character, but it can be used to report actions of a character, too.

- (5) ANNA-3 3-SAY-1 body shift to 3 IX-1 FED-UP LOOSE [LSC]
'Anna told me she was fed up with loosing so often.'

The last point we want to address does not concern properties of the grammar of sign languages, but rather the availability of different manual communication systems. It is important to realize that signers often use more than one system of communication. In many countries, including Russia and the Netherlands, artificial manual communication systems exist next to natural sign languages (see Zajtseva 2006 for Russia, Terpstra and Schermer 2006 for the Netherlands). These systems have mainly been created by hearing people for teaching or interpreting purposes, and they in fact constitute a mix of the national sign language and the spoken language used in the country. Signs which are used in such systems are the same as used in the sign languages, but the grammar follows the grammar of the spoken language. In particular, word order is taken from, for instance, Russian or Dutch. In addition, some grammatical elements absent in the respective sign language, such as Dutch articles or Russian case endings, can be added in the form of artificial signs or fingerspelled sequences. In case of NGT and RSL, such systems are called Signed Dutch and Signed Russian, respectively.

The existence of such systems presents us with a very interesting contact phenomenon. However, for the purpose of studying natural sign languages, these systems constitute an obstacle. Given the fact that such systems exist within the same modality as sign languages, a mix of the two types of systems often occurs. In addition, signers commonly adapt to the

conversation partner, so for instance when communicating with a hearing non-fluent signer, they would very likely use such as system instead of a natural sign language. When collecting sign language data, it is therefore important to try to exclude the use of such artificial systems. In the methodological sections of chapters 3-6, we will explain how this aspect has influenced the design of our studies.

1.2 Sign languages: typology and modality

The previous section made it clear that it is important to study sign languages in order to come to serious theoretical generalizations about the language capacity in general. In this section, we discuss three related issues: how different sign languages are from each other (section 1.2.1), how sign languages contribute to the field of typology (1.2.2), and how sign languages help us in uncovering modality effects (section 1.2.3).

1.2.1 Comparison of sign languages

Sign languages, being natural languages, are expected to differ from each other. However, despite the fact that sign languages are different from each other, the extent and nature of the differences are far from clear. Therefore, a detailed comparison between two sign languages, as the one attempted in this dissertation, is quite interesting.

Zeshan (2008) described the history of research on differences between sign languages. Sign language linguistics is a very young discipline, starting from the seminal work of Stokoe (1960). This first work, along with a large proportion of all works within sign linguistics, has been devoted to ASL. Early research on ASL has been followed by research on European sign languages: British Sign Language, Swedish Sign Language, and also on Sign Language of the Netherlands. Subsequently, linguists also became interested in non-European sign languages, and only very recently in village sign languages. The field of sign language typology is thus very young. However, some interesting results have already been achieved. For instance, the papers collected in Zeshan (2006) analyzed negation and questions based on a variety of both Western and non-Western sign languages; the papers in Zeshan and Perniss (2008) analyzed possessive and existential constructions. Note, however, that to date there is no typological research on sign languages in the domain of IS.

Another reason to pay special attention to comparison between sign languages is the idea that sign languages are more similar to each other than spoken languages due to modality effects (Meier 2002, see also section 1.2.3). Recently, this idea has been criticized based on the newly available data from village sign languages, which do not obey some of the generalizations that hold for Western urban sign languages (see Schuit 2013 for a recent discussion). However, Russian Sign Language and Sign Language of the Netherlands belong to the same group of Western urban sign languages, so we might still expect them to be very similar to each other – probably due to modality effects, but possibly also through (indirect) contact. Therefore, a detailed comparison is necessary to show how similar or different they really are.

Typological studies which compare two or more sign languages in detail with respect to some linguistic phenomenon are not unheard of. For instance, Dachkovsky et al. (2013) compared non-manuals in ASL and Israeli Sign Language (ISL) and did not only find many interesting differences both in the phonetics and in the pragmatic functions of non-manuals, but also significant overlap in their phonology and functions. Perniss and Özyürek (2008) compared German Sign Language (DGS) and Turkish Sign Language in the domain of representation of motion and location, and again identified similar strategies (entity and

handling classifiers) but also some non-trivial differences in the combination of classifiers and points of view. Herrmann (2013) looked at modal and focus particles in three sign languages: Irish SL, German SL and NGT, and again found both similarities and differences between the languages.

In this dissertation, RSL and NGT are compared in the domain of IS. We acknowledge that typological generalizations cannot be made based on data from only two sign languages. At first sight, finding common patterns between RSL and NGT may not seem very informative, as they are both European Western sign languages, which might account for a lot of similarities. However, finding differences is still instructive, as any difference is evidence of the cross-linguistic variation in a domain that has not been studied from a typological perspective before.

1.2.2 Sign languages and typology

As mentioned above, sign language typology is a young and small field. It is very complicated to do typological research on sign languages, for the simple reason that to date too little research has been conducted on individual sign languages. For the same reason, it is also very difficult (if not impossible) to include sign languages together with spoken languages in a sample for typological research. The latter task is also complicated by the lack of a clear picture of genetic relatedness between sign languages. Therefore, typological studies based on samples of languages do not include sign language data.

However, it is still possible to bring sign languages into the typological debate. Researchers working on individual sign languages or groups of sign languages can test typological generalizations formulated on the basis of spoken languages. Sometimes these generalizations are confirmed, and sometimes sign languages behave in a typologically peculiar fashion.

As an example of the former scenario, consider relative clauses. Spoken languages have been shown to use two major types of relative clauses: head-internal and head-external ones, the latter being the more common one (Dryer 1992). These types are distinguished by the position of the noun which is modified by the relative clause: it can either appear within the relative clause itself (head-internal relative clause), or outside of the relative clause (head-external relative clause). Although it is not really possible to discuss which of the two types is more common in sign languages, it is clear that both types are attested. For instance, in DGS relative clauses are formed head-externally (Pfau and Steinbach 2005), while in Italian Sign Language and ASL both head-internal and head-external relative clauses are attested (Liddell 1978, Branchini and Donati 2009). This means that the typological classification is also relevant for sign languages, that is, it is modality-independent.

On the other hand, if we look at the domain of wh-questions, sign languages present a typologically unusual pattern. In spoken languages, there are two common strategies for the placement of wh-words: in the left periphery, following leftward movement (as in English), or *in situ* (as in Chinese). Placement of the wh-word in a right-peripheral position is very atypical for spoken languages. In contrast, most sign languages allow for rightward wh-movement and wh-doubling, and rightward wh-movement is even more common than leftward wh-movement. *In situ* placement, on the other hand, is not common at all (Zeshan 2004). Some researchers have therefore suggested to account for the position of wh-words in sign languages by reference to a modality effect (Cecchetto, Geraci and Zucchi 2009).

Researchers who have investigated IS in sign languages have tried to put sign languages in typological perspective as well (Sze 2008, 2011, see also Wilbur 2012, and Kimmelman

and Pfau to appear for overviews). In this context, the novel data from RSL and NGT discussed here are expected to contribute to the typological picture.

1.2.3 Modality differences and modality effects

The issue of modality differences has been addressed by many authors (see, for instance, Sandler and Lillo-Martin 2006, chapter 25). The most recent discussion of modality is provided by Meier (2012). Meier separated the discussion of modality factors that may affect the production and perception of signs from the discussion of the linguistic effects they have. He also analyzed the factors that might be relevant in the acquisition of sign languages, but this aspect will not be addressed in the following discussion.

The most obvious differences between sign languages and spoken languages concern the articulators and the perception organs. Hands, which are the primary articulators in sign languages, are larger than the mouth and they move more slowly. In addition, hands are paired articulators, in other words, there are two partially independent articulators. Moreover, the hands, unlike the speech apparatus, are directly visible. Finally, visual perception is better suited to distinguish spatial information than auditory perception, that is, there are cognitive differences between processing of visual vs. auditory information. These physiological and cognitive differences also have linguistic consequences.

It has, for instance, been shown that sign languages exploit the potential of simultaneity on different linguistic levels: phonological components of the sign are combined simultaneously; morphology is mostly simultaneous; and some syntactic structures are simultaneous as well. Spoken languages, on the other hand, are largely sequential on all levels. Of course, it is easy to see that this property of spoken languages results from a modality constraint: it is simply not possible to articulate multiple sounds or words simultaneously, and it is also not possible to perceive them simultaneously. As sign languages lack such a constraint, they are free to employ simultaneous organization. In addition, it has been argued that simultaneity compensates for the fact that the hands are slower articulators (Bellugi and Fischer 1972).

Another major difference between spoken and sign languages, which is a consequence of modality, is iconicity. Obviously, in the visual modality, it is easier for a lexeme to resemble the shape of its referent than in the auditory modality, simply because objects themselves are mostly visual, not auditory. Beyond the lexicon, iconicity has an effect on phonology and morphology of sign languages as well (Perniss, Thompson and Vigliocco 2010).

Finally, sign languages use space as a part of the grammar: in locating referents, in verb agreement, and in classifier predicates (see section 1.2.2). Again, the auditory modality cannot allow for the linguistic use of space, as sounds are not spatial.

To sum up, the physiological and cognitive differences between signed and spoken languages lead to linguistic differences in three domains: simultaneity, iconicity, and use of space. All these domains are potentially relevant for the expression of IS, also in RSL and NGT, as we will discuss in chapter 7.

1.3 Background information on RSL and NGT

In order to explore variation between sign languages, data from two unrelated sign languages, RSL and NGT, will be compared. Analyzing only two sign languages is a compromise. On the one hand, in order to discuss typological variation across sign languages, as well as issues of modality, it is necessary to study many sign languages. On the other hand, given the lack of descriptive data from most sign languages, such a large-scale comparison involving a

considerable number of (unrelated) sign languages is not feasible. We therefore decided that it would be informative to describe IS in two sign languages in detail, based on primary data, in the hope to find some cross-linguistic variation even in such a small set of languages. It is hoped that future studies on other sign languages will add to the data pool, confirming some of the patterns that we identified and also adding new strategies to the picture. In this section, we introduce the two languages under investigation: NGT in section 1.3.1 and RSL in section 1.3.2. In section 1.3.3, we summarize the similarities and differences between the languages.

1.3.1 Sign Language of the Netherlands

Sign Language of the Netherlands is a language used by deaf and hard-of-hearing people in the Netherlands. According to Crasborn's (2001) estimation, it is used by approximately 16,000 people. The language does not yet have an official legal status.

NGT emerged at the end of the 18th century when the first school for deaf children was set up in Groningen (Wingerden 2003). The founder of the first school, H.D. Guyot, had visited the founder of the first school for the deaf in France, Abbé de l'Épée, and had brought his manual method – that is, the use of signing to teach deaf children – to the Netherlands. It is therefore sometimes claimed that NGT is related to French Sign Language. However, to our knowledge, there is no research on the similarities between NGT and French Sign Language nowadays.

After the foundation of the first school, four more schools were opened in the course of the 19th and at the beginning of the 20th century; these schools are located in Sint-Michiels-Gestel, Rotterdam, Den Haag, and Amsterdam. The three latter schools used predominantly the oral method of education, that is, only spoken language was used, while the use of signing was prohibited. In the 1980s the total communication method was introduced, which encourages the use of all available means of communication – sign language, spoken language, signing systems. In the 1990s, this method was substituted by bilingual education (sign + spoken language). In the current situation, a large proportion of children receive cochlear implants at an early age, and educational politics is again changing in the oralist direction (Knoors and Marschark 2012).

NGT is characterized by a high regional lexical variation: there are five major dialects attributed to the five schools for deaf children (Schermer 2004). In 1999, the Sign Language Center of the Netherlands (*Nederlands Gebarencentrum*) started a project to standardize NGT (as a precondition for its official recognition), and this process is still ongoing. There is, however, very little research on grammatical differences between the NGT dialects.

NGT is a comparatively well-studied sign language. Starting from the pioneering works by Ben Tervoort in the 1950s, there is descriptive research on various aspects of its grammar, psycholinguistic studies (e.g. on first language acquisition and bilingualism), and various studies that address structural aspects from a theoretical perspective (an overview can be found in Baker, van den Bogaerde, Pfau and Schermer 2008). Most relevant to the current dissertation, IS in NGT has been studied to some extent as well. Coerts (1992) described non-manual topic markers in NGT; van der Kooij, Crasborn and Emmerik (2006) argued that body leans in NGT are related to IS; Crasborn, van der Kooij, Ros and de Hoop (2009) analysed a phenomenon that they refer to as “topic agreement”; and most recently, Crasborn and van der Kooij (2013) discussed focus markers in NGT, and Herrmann (2013) described focus particles in several languages, including NGT. However, as we will show in chapters 2-6, many aspects of IS-marking still need further analysis.

1.3.2 Russian Sign Language

Russian Sign Language⁴ is a language used by deaf and hard-of-hearing people in Russia and probably some other former Soviet countries, such as Ukraine and Belorussia. According to the latest census organized in 2010, it is used by 120,000 people in the Russian Federation alone (see the preliminary results of the census reported <http://www.rg.ru/2011/12/16/stat.html>). On December 30, 2012, RSL received an official status (<http://www.kremlin.ru/acts/17244>). Potentially this will lead to more use of RSL in deaf education, to the training of interpreters, and to further linguistic research on RSL.

RSL emerged at the beginning of the 19th century, as the first school for the deaf children was founded in 1806 in Pavlovsk. There is some anecdotal evidence that RSL is related to French Sign Language, as the first teachers were trained in France and Vienna. However, there is no evidence that French Sign Language has indeed been used in the school in Pavlovsk. Bickford (2005) reported that one of the early French teachers, who worked in Russia, Jean-Baptiste Jauffret, did not know French Sign Language. Bickford's research on a lexical comparison of sign languages of Eastern Europe also did not confirm that RSL belongs to the family of French Sign Language.

The history of deaf education in Russia is typical for European countries (Zajtseva 1987). In the most of the 19th century the French method was used, that is, sign language was allowed. Education then became oralist, until the first school became bilingual in Moscow in 1992 (Pursglove and Komarova 2003). However, it is still oralist in most schools in Russia.

RSL is used in a very large area, and there are one or more deaf schools in every major city, which might lead one to expect a large dialectal variation. However, very little research has been done in this domain. Burkova and Varinova (2012) studied lexical variation in RSL and showed that the variation is actually quite low, restricted to only some lexical domains and occurring mainly among young signers. There is hardly any research on grammatical variation, although some variation can be found at least in the domain of reflexive pronouns (Kimmelman 2009b).

Until recently, very little research has been done on the linguistic structure of RSL, and virtually no research on psycholinguistic aspects of RSL exists. The only exceptions are the works of Galina Zajtseva (Zajtseva 2006), who has studied RSL for decades, and an overview article by Grenoble (1992). Recently, several aspects of RSL have been studied by undergraduate and graduate students in Moscow: verbal morphology (Prozorova 2004), aspect (Shamaro 2006), anaphora (Prozorova and Kibrik 2007), negation (Kimmelman 2007), possession (Tsypenko 2008), question-words (Viktorova 2007), and the noun-verb distinction (Kimmelman 2009a). In addition, reflexive pronouns (Kimmelman 2009b), and word order (Kimmelman 2012a) have been studied. Prozorova (2009) is the first linguistic PhD dissertation on RSL; it is devoted to the prosody of RSL. Currently, a group of researchers in Novosibirsk is building a corpus and describing the grammar of RSL based on these corpus data. Their publications include papers on conditionals (Burkova 2012), distributive aspect (Filimonova 2012), and imperatives (Borodulina 2012). IS has not been previously described for RSL, although Shamaro (2008) analysed doubling, which, as we argue in chapters 2, 4 and 5, is a potential marker of IS in RSL.

1.3.3 Comparison between RSL and NGT

From the previous two sections, we can conclude that there are both similarities and differences between RSL and NGT. One difference that is not linguistically relevant is the

⁴ In Russian – русский жестовый язык, abbreviated as РЖЯ.

fact that RSL has been studied by linguists much less than NGT. This means that for RSL we will have to describe most of the phenomena for the first time, while for NGT, we can build on previous research and compare our results with those of previous studies.

Another obvious difference is the size of the population of signers: RSL has at least seven times the number of signers compared to NGT. There is some research showing that the size of the language community can have an influence on certain linguistic features (Lupyan and Dale 2010), so this difference might play a role in explaining some linguistic differences between RSL and NGT as well.

Finally, although it is difficult to assess, and we rely on anecdotal evidence to some extent here, it seems to be the case that NGT has a higher degree of regional variation, at least in the lexical domain. Further research is needed to confirm this intuition.

As for the similarities, both languages are approximately 200 years old, and since they are both used in Europe, they also share some common history. For both languages, a connection to French Sign Language has been reported, but this connection is not certain (especially so for RSL). Our own research on RSL and NGT (starting from Kimmelman 2009b and continued in this dissertation) suggests that RSL and NGT do not show much lexical similarity; as far as the grammars are concerned, this dissertation is the first study to offer a systematic comparison between the two languages.

RSL and NGT have undergone similar paths with respect to educational policies: in the 19th century, the manual method had been used, with a gradual shift toward the oralist method by the beginning of the 20th century. However, near the end of the 20th century, the languages diverged: the total communication method and the bilingual method were used earlier and more extensively in the Netherlands than in Russia. Currently, the Netherlands are again shifting toward oralist education, and in Russia this method is also at present the most common one.

The choice of RSL and NGT for this study was at least partially pragmatically motivated. We have done research on both these languages previously and we have contacts in the respective Deaf⁵ communities. In addition, for NGT a large corpus has been collected and is being annotated (Crasborn and Zwitserlood 2008). On the other hand, there are theoretical factors that make such a comparison meaningful. Some studies discussed in section 1.2.1 have shown that even comparing two European sign languages can be very productive. In addition, since RSL and NGT are unrelated, we can discuss the issue of modality effects (section 1.2.3). Finally, since some sociolinguistic differences between RSL and NGT are observed, we can also address their effects on the linguistic properties of the languages. In the future, it will be very useful to compare RSL and NGT to other sign languages, including non-Western and village sign languages (Schuit 2013). This dissertation can serve as a first step on the way towards the study of variation in sign languages in the domain of IS.

1.4 Notions of Information Structure

As mentioned in section 1.1.1, comparatively little is known about IS in sign languages and in particular in RSL and NGT. In this section, we introduce the notion of IS itself (section 1.4.1), and then discuss two of the main notions within the domain of IS, namely topic (section 1.4.2) and focus (section 1.4.3). Note that this section is based on previous research on spoken languages, while the expression of IS in sign languages is discussed in chapter 2.

⁵ *Deaf* is capitalized to refer to the Deaf community as a cultural and linguistic minority, as opposed to the term *deaf* referring to the hearing status (Lane 2005).

1.4.1 Information Structure

There is a plethora of literature on IS, so it is a futile enterprise to do justice to the current thought in this field within a short introduction. Therefore, in this section we only introduce basic ideas that are relevant to the present study and that are accepted by most people in the field, based on Krifka (2008) and Zimmerman and Onea (2011). A reader interested in IS as a field can start with Krifka (2008) as a general guideline.

Krifka (2008) argued that a useful notion when speaking about IS is the notion of Common Ground (Stalnaker 1974). Common Ground is the knowledge shared by the interlocutors. In the course of communication, the Common Ground is constantly changing. For instance, the speaker who utters the sentence (6) tells something new to the addressee, namely, that the monk went to Paris. This new piece of information has then to be included in the Common Ground.

(6) The monk went to **Paris**.⁶

According to Krifka, it is necessary to distinguish between Common Ground content, and Common Ground management. In example (6), the proposition “the monk went to Paris” is the content. However, when the speaker utters this sentence, he also instructs the addressee how to interpret it. In this case, for instance, the speaker uses the definite noun phrase *the monk*, and the fact that this noun phrase is definite is a signal to the addressee that the referent should be familiar, that is, already be a part of the Common Ground. In addition, the main phrase accent falls on *Paris*, thereby instructing the addressee that this is new information that should be added to the Common Ground. The example thus illustrates that a speaker may employ morphosyntactic (choice of determiner) and prosodic (stress) means to signal IS.

IS is primarily related to Common Ground management.⁷ It is concerned with the signals that the interlocutors give each other in order to control and manage information flow, such as marking given information for the ease of locating it in the Common Ground and highlighting new and important information as a signal for Common Ground update. These two functions: marking information as belonging to the Common Ground, and marking information as necessary for updating the Common Ground, are tightly connected to the notions of topic and focus, respectively.

1.4.2 Topic

The notion of (sentence) topic is easier to understand in terms of a metaphor introduced by Reinhart (1982) and developed in Vallduví (1992). It is useful to picture Common Ground as a file card system. Each proposition is written on a card, and each card has a header which helps identify and locate it. The topic of the sentence would therefore be a constituent that is also the header of a file card in the Common Ground. The rest of the sentence is usually called “the comment”.

Applying this metaphor to example (6), the Common Ground contains a card with a header “the monk” and some information written on it about the monk. When (6) is uttered, the topical constituent of the sentence “the monk” is the signal to the addressee to find this particular card and to add new information, the comment “is in Paris”, to this card.

⁶ Here and further on, **bold** face is used to mark the main sentence accent.

⁷ As Krifka (2008) argued, IS is also interested in Common Ground content. For instance, focus can have semantic effects in interaction with focus-sensitive operators. However, this is not directly relevant for the current dissertation.

This metaphor has important consequences. For instance, if topics are used to identify cards with information in the Common Ground, these cards should already be there. Therefore, as Reinhart (1982) argued, topics cannot be new information; they have to be given. However, it is also very important to understand that the notion of topic cannot be reduced to the notion of given information. Consider the examples in (7).⁸ Both the subject and the object are given information, and both examples express the same proposition (A.O and J.K married). However, the first sentence is telling something about Aristotle Onassis, while the second one conveys information about Jacqueline Kennedy. Based on such examples Reinhart argued that topics are defined by *aboutness*: a topic is what the sentence is about.

- (7) a. [Aristotle Onassis]_{Topic} [married Jacqueline Kennedy]_{Comment}.
 b. [Jacqueline Kennedy]_{Topic} [married Aristotle Onassis]_{Comment}.

The problem with this definition is that it is not very operational. It is not always possible to say what the sentence is about, and multiple interpretations are possible. Therefore, in chapter 3 we discuss the topic identification procedure in much detail. In addition, not all researchers agree that topics have to be given information; some theories allow topics to be new information as well (Gundel 1998).⁹ If we accept that, identification of topics becomes almost impossible; therefore, in identifying topics, we will presuppose that topics have to be given. However, in chapter 3 we also discuss the possibility that new topics might exist in RSL and NGT as well.

Topic defined as above is a notion of IS, and not a grammatical notion. But in many languages, this IS-status is marked by grammatical means. For instance, in Russian, English and German, some types of topics are marked by rising intonation (Büring 1997). Based on a sample of 30 languages from different families and different parts of the world, Gundel (1988) conducted typological research on IS and found several universals in the domain of topic-comment structure. One of the generalizations she formulated is that every language in her sample has a construction in which the topic is left-adjoined to a full sentence comment, and also that every language has a construction in which the topic is right-adjoined to a full sentence comment. For instance, in (8a) the topic *Petja* is left-adjoined to the full sentence meaning ‘he came yesterday’; note that the sentence contains the pronominal subject *on* ‘he’. Similarly, in (8b) the topic *Petja* is right-adjoined to the same full sentence.

- (8) a. Petja, on včera prišol [Russian]
 Petja he yesterday come
 ‘As for Petja, he came yesterday.’
 b. On včera prišol, Petja
 he yesterday come Petja
 ‘As for Petja, he came yesterday.’

Thus, in studying the notion of topics in RSL and NGT, we are in fact going to identify potential markers of topics in these languages (chapter 3), and then discuss whether these markers look similar to the ones found in other signed and spoken languages (chapter 7).

⁸ No contrastive stress is entailed in these sentences.

⁹ There are also many alternative theories and labels around the notion of topic. For instance, Vallduví (1992) claimed that the sentence is divided into focus and background, and that the background is further divided into link (comparable to topic in the terminology introduced above) and tail (elements that are functionally topical but are placed clause-finally).

Even if a language has a marker of topics, topics often remain unmarked. On the other hand, some languages mark the fact that a sentence does not have a topic. Sasse (1987) argued that sentences can be divided into two types, categorical (containing a topic and a comment) and *thetic* (not dividable into subparts). Some languages have special strategies to mark *thetic* sentences. For instance, in Russian such sentences often involve the VS order, as in (9), where the whole sentence “A girl has entered” is new information. It will be interesting to investigate whether RSL and NGT also employ dedicated strategies for marking *thetic* sentences (chapter 3).

- (9) Vošla devočka [Russian]
 entered girl
 ‘A girl has entered.’

Typological research has shown that some languages mark topics more consistently than others. To account for this difference, a notion of topic prominence is often used. This notion has been introduced by Li and Thompson (1976), who argued for a four-way typology: all languages can be classified into +/- topic-prominent and +/- subject-prominent. In topic-prominent languages (such as Chinese, Lisu and Lahu), grammatical rules refer to the notion of topic, while in subject-prominent languages (such as English or German), the notion of subject is referred to by many grammatical rules. Note that Li and Thompson also allow languages to be both subject- and topic-prominent, as well as to be neither subject- nor topic-prominent.

É. Kiss (1995) refined the definition of topic prominence by focussing the obligatory marking of topics. She claimed that topic-prominent languages consistently differentiate *thetic* sentences from sentences with topics (categorical). On the other hand, McShane (2005) offered different criteria of discourse-orientation, one of the most important ones being extensive use of ellipsis. As discussed in chapter 2, some sign languages have been claimed to be topic-prominent as well. Therefore, we also address this possibility for RSL and NGT in chapter 3.

Above we defined only one type of topics, which are often called ‘aboutness topics’, as they are defined through the notion of aboutness. However, some researchers have identified further types of topics, namely contrastive topics, scene-setting topics (Jacobs 2001), and discourse topics. The notion of contrast will be introduced in the next section, but the other two notions are presented here. In some languages, topic marking (intonational and syntactic) applies to constituents which describe the time and place of the event, as in the English example (10).

- (10) Yesterday, Peter went to Paris.

In this example, the adverb *yesterday* is placed at the beginning of the sentence, and it can also be accompanied by rising intonation, as commonly used with topics. However, it is clear that *yesterday* is not an aboutness topic: it does not identify a card on which the information should be stored; in fact *Peter* is the aboutness topic here. Therefore, some researchers, such as Krifka (2008), claimed that *yesterday* is not a topic, but a “frame setting”. However, others, such as Jacobs (2001), argued that it is reasonable to analyze such adverbs as a subtype of the general category of topics, namely as scene-setting topics. Firstly, frame settings share some properties with contrastive topics in that they restrict the domain of application of the rest of the sentence (for details, see Krifka’s and Jacobs’ discussions of the phenomenon). In addition, in many languages frame settings are marked by the same markers as aboutness topics. As we demonstrate in chapter 2, this is also true for some sign languages. Therefore, in

our quest for IS-marking in RSL and NGT, we will also look at scene-setting topics in chapter 3.

Finally, the notion of discourse topic has to be introduced. Both scene-setting and aboutness topics are sentence-level phenomena. However, one can also speak of a topic of discourse consisting of several sentences. For instance, paragraphs in written texts are usually organized around one idea, which can be considered a topic of this paragraph, or a discourse topic (Shiffrin 1994). This phenomenon is of course not restricted to written speech, as oral narratives are also organized in episodes which usually have one topic. The important difference between sentence topics and discourse topics is that the former are marked by linguistic means, while the latter are only identified indirectly – at least in spoken languages (as we are going to show in chapter 6, the situation may be different for sign languages).

1.4.3 Focus

Another key notion of IS is focus. Zimmerman and Onea (2011) even argue that it is a universal pragmatic notion, although the realizations are different cross-linguistically. Intuitively, focus is the part of the sentence that is highlighted by the speaker so that the addressee understands that this part contains new and important information that should be added to the Common Ground. Put even more simply, focus can be conceived as the part of a sentence which answers a question – be it an overt or a covert one. For instance, in (11), interlocutor A asks a question “Who went to Paris?”, and the part of B’s sentence which is the direct answer to this question, namely *Peter*, is the focus of the sentence.

(11) A: Who went to Paris? B: **Peter** went to Paris.

Many researchers, including Krifka (2008) and Zimmermann and Onea (2011), have argued that focus should be defined through alternatives (Rooth 1992). Krifka (2008:247) proposed the following definition: “Focus indicates the presence of alternatives that are relevant for the interpretation of linguistic expressions.” If we apply this to (11) above, focus on *Peter* indicates that there are alternatives to the proposition expressed in this sentence, namely “John went to Paris”, “Mary went to Paris”, etc. B’s sentence indicates that out of all of these alternatives only one is true, namely, “Peter went to Paris”. Note also that these alternatives are actually introduced in the context by the question “Who went to Paris?”: asking such a question evokes the alternatives. The fact that the dialogue in (11) is well formed is the result of the match between the alternatives evoked by the question and the alternatives evoked by the focus in the answer. Analysis of focus in terms of alternatives is very useful when studying semantic effects of focus, such as the interaction of focus with the focus particles *only* and *also*. However, in this dissertation, we will not further pursue this issue, and therefore, the more intuitive definition of focus answering a question is sufficient for our purposes.

As Zimmermann and Onea (2011) showed, focus can be marked in different ways cross-linguistically. One of the most common markers of focus is intonation, and in particular, phrasal accent. For instance, in (11) focus on *Peter* is marked by the fact that *Peter* receives the main stress of the sentence. Focus can also be marked by word order. For instance, in Spanish the focused subject of a transitive verb has to move to the sentence-final position, as in example (12a) from Büring (2010:190).¹⁰ Finally, some languages, such as Gungbe, also have morphological focus markers; for instance, the particle *wè* in (12b), adapted from Aboh (2010:16), marks *dàn* ‘snake’ as focus.

¹⁰ Juan ‘John’ is also marked by phrasal accent in this example.

- (12) a. [Who bought the newspaper yesterday?] [Spanish]
 Ayer compró el periódico **Juan**
 Yesterday bought the newspaper John
 ‘John bought the newspaper yesterday.’
- b. Ûn sè gɔ̃ dān lɔ wè Kòfɪ hù [Gungbe]
 1SG hear that snake DET FOC Kofi kill
 ‘I heard that Kofi killed **the snake**.’

In chapter 2, we will discuss previous studies on focus marking in sign languages, and in chapter 4, we will present the results of the analysis of focus marking in RSL and NGT.

One important property of focus marking is that it is often underspecified. This phenomenon is commonly known as focus projection (Zimmermann and Onea 2011). Consider example (13) from Zimmermann and Onea (2011:1659). The sentence “Peter bought a book about **bats**”, with main stress on *bats*, can be an answer to four different questions, which implies that this sentence can have four different foci: on the complement of the prepositional phrase “bats”, on the object “a book about bats”, on the VP “bought a book about bats”, and on the whole sentence. Yet, only a part of the direct object is in fact marked by accent, so focus “projects” from the overtly marked constituent to constituents containing it.

- (13) A: What did Peter buy a book about? / What did Peter buy? / What did Peter do? / What happened?
 B: Peter bought a book about **bats**.

Zimmermann and Onea (2011) argued that focus projection is to be expected given the fact that focus is not a grammatical, but an Information Structural notion. This means that focus is often expressed, but it does not have to be, and it definitely does not have to be expressed unambiguously. Some researchers considered focus projection to be universal (Selkirk 1995), but other argued against focus projection in some languages (Koch 2008). Therefore, the universality of focus projection can be tested on the basis of sign languages, and this is what we are going to do in chapter 4, where we assess whether focus projection also exists in RSL and NGT.

In addition, Zimmermann and Onea provide a typological generalization concerning the marking of different syntactic constituents with focus marker: subject focus is generally more marked than other types of focus. Empirically this generalization is based on a study of Chadic languages, which always unambiguously mark subject focus, but do not mark other types of focus (Fiedler, Hartmann, Reineke, Schwarz, and Zimmermann 2010). Theoretically this asymmetry is explained by the fact that subjects are prototypical topics, while the VP is usually the focus. Consequently, languages tend to omit any markers when these prototypical roles are fulfilled; however, if the subject becomes focus, it has to be marked.

Above we used *wh*-questions as a definition of (or as a test for) focus. However, a focused constituent can be an answer to different types of questions, which lead some researchers to divide focus into further subtypes (Dik 1997). In particular, focus as an answer to a *wh*-question is often called information focus (14a); if two (or more) alternatives are present and the answer selects one of the alternatives, it is called selective focus (14b); finally, if a correction is made, one can speak of a corrective focus (14c).

- (14) a. What did Peter buy? – He bought a book.
 b. What did Peter buy: a book or a newspaper? – He bought a book.
 c. Did Peter buy a newspaper? – No, he bought a book.

In some languages, these types of focus can be marked differently. For instance, in Russian, selective and corrective focus can be expressed with the help of the so-called *éto*-cleft (Kimmelman 2009c), while information focus is not compatible with this construction. Zimmermann and Onea (2011) noted that it is common for contrastive focus to be more marked than information focus cross-linguistically. For instance, contrastive focus tends to be marked by marked grammatical constructions and by stronger realizations of focus accents. In section 2.3, we discuss studies which have shown that different types of focus are marked differently in sign languages as well, and in chapter 4, we investigate whether this is also true for RSL and NGT.

In the field on IS, there is a debate on the relation between the notions of focus and contrast in general. Contrast means that two or more alternatives are present in the context which are opposed to each other, so the sentences in (14b,c) involve contrast; however, contrast can be present even when there is no selective or corrective context. Consider another sentence in (15), which contains two clauses; the focus of the first one is *a cat*, while the focus of the second one is *a dog*. These foci are also contrasted with each other, as revealed by the presence of the contrastive conjunction *but*, but also because *cat* and *dog* would be marked by a special contrastive focus accent in the spoken form.

- (15) John has a **cat**, but Mary has a **dog**.

It is often claimed that focus, even information focus, always involves some degree of contrast (Krifka 2008). Above we introduced a theory of focus according to which focus always invokes alternatives. Indeed, with such a definition, it is not possible to imagine non-contrastive focus. In addition, in many languages contrastive focus is marked by the same means as what could be called non-contrastive focus.

However, some researchers argued that contrast is a notion separate from focus (Molnár 2001). There are several arguments in favor of this position. First, as we have mentioned in the previous section, topics can be also contrastive. In fact, example (15) is an illustration: the topics *John* and *Mary* are also contrasted to each other, and they are marked by rising intonation typical for contrastive topics in English. Moreover, some languages, such as Finnish and Russian, have markers which only mark contrast (no matter whether topical or focal information is contrasted), and never mark focus which is non-contrastive (such as an answer to a simple wh-question).

Therefore, it is very interesting to investigate whether focus and contrast can be analyzed as separate notions in RSL and NGT as well. In section 2.3, we will briefly address this issue based on previous research on sign languages, and in section 4.8, we will present the findings for RSL and NGT on this issue.

In addition, yet another type of focus has been identified, namely emphatic focus (Krifka 2008). This type of focus appears when the sentence describes something unexpected. In more formal terms, it is used when the alternative in focus is the least or the greatest element on some scale. For instance, in (16) *John* is the member of a group who is least likely to do his homework, but he did do it. Emphatic focus is often accompanied by emphatic particles, such as English *even*. In section 2.3, we will show that this type of focus has been connected to a special marking in some sign languages, namely to doubling.

- (16) Even **John** did his homework.

Finally, there is quite some typological research on focus marking. One such typological study is presented by Büring (2010), who argued that focus is universally expressed by prosodic prominence, but that this prominence can have different phonetic realizations, and a language may have different strategies to change the default prominence. As for the former distinction, some languages such as English use stress to express prominence, while others (such as Chichewâ) align the prominent constituent with a prosodic boundary.

The latter distinction concerns the cases in which some constituent in focus has to receive prominence. Here Büring makes a distinction between boundary languages, which create a prosodic boundary to adjust prominence patterns, and edge languages, which move the constituent to a different position where it can receive prominence. In section 7.3.2, we will discuss whether this classification is applicable to RSL and NGT as well.

1.5 General research questions

The review in the previous sections has indicated that the study of IS in RSL and NGT needs to address some general issues. The general research question of this project can be formulated as follows:

- GQ1:** How is IS expressed in RSL and NGT?
- GQ2:** What are the similarities and differences between RSL and NGT in this domain?
- GQ3:** What are the typological implications of the RSL and NGT data?
- GQ4:** What modality effects can be identified in the domain of IS in RSL and NGT?

In order to answer the first question, we will use two approaches. First, we will go from meaning to form, thereby identifying how the notions of topic and focus are marked in RSL and NGT. Second, we will go from form to meaning, by investigating the functions of two potential IS-markers, namely doubling and weak hand holds. Doubling is a process whereby a constituent appears in the sentence twice in two different positions. We are dealing with a weak hand hold when one of the hands is held in a configuration and location of a sign, while the other signs several other signs. Many sign languages have been shown to commonly use these markers in functions connected to IS (the details follow in sections 2.4 and 2.5). Therefore, it is instructive to look at these markers in RSL and NGT and find out what functions they have. The strength of this approach lies in the fact that it will not only allow us to describe the very common IS-functions, but also to find out whether IS in RSL and NGT involves notions which go beyond topic and focus per se.

Once we have the data about topic and focus marking, as well as results concerning the functions of doubling and weak hand holds, we will be able to compare RSL and NGT to each other. In section 1.2.1 we discussed the importance of such comparative research on sign languages. As described in section 1.3, there are both similarities and differences between the languages. We will investigate whether this is also true in the domain of IS.

Furthermore, we will look at the RSL and NGT data from a typological perspective, as introduced in section 1.2.2. Do RSL and NGT follow the patterns found in spoken and other sign languages? Do they display any peculiarities that may add to our understanding of the typology of IS in general?

Finally, we will discuss some aspects of IS that can be potentially unique to sign languages (see section 1.2.3). Thus we hope to contribute to one of the most fundamental questions of sign linguistics, namely the question of modality effects.

Our more detailed research questions about IS in RSL and NGT are based on previous research on IS in other sign languages. Since the outcome of previous studies is only summarized in chapter 2, we will formulate the detailed research questions in that chapter.

In this dissertation, the only theory that we are actively using is the theory of IS. The basic principles of this theory have been outlined in the previous section (see Krifka 2008 for further discussion). Since, in the remainder of this dissertation, the data will be described on a relatively basic level, there is no need to choose a theoretical framework, such as Generative Grammar or functionalism. We do think that the data from RSL and NGT can be an important contribution to theoretical discussions in the domain of IS; however, at this stage of research, it is not possible to pursue a detailed theoretical analysis. The only exception to this descriptive approach is present in section 6.6, where we do apply the formalism of (a version of) Generative Grammar to the weak hand hold data. However, this section is not crucial for the whole project; it should rather be seen as a sort of side track, and the account presented there is therefore not further discussed in the final conclusions in chapter 7.

1.6 Structure of the dissertation

The first chapter of this dissertation provides the background information relevant to the project. We introduced the field of sign linguistics and the two sign languages under analysis. In addition, we discussed the basic IS notions necessary to formulate the research questions, and these general research questions have subsequently been presented.

In the presentation of previous research on IS in sign languages (chapter 2), we will discuss how the notions of topic and focus are expressed in the visual modality. In addition, we summarize studies on two constructions that have been associated with IS, namely, doubling and weak hand holds. Based on previous research, we formulate detailed research questions to be answered for RSL and NGT in the following chapters.

The results on topic marking in RSL and NGT are presented in chapter 3. We do not only describe the attested strategies based on a corpus study, but also discuss the question whether RSL and NGT can be considered topic-prominent languages.

In chapter 4, we turn to the results concerning focus marking in the two languages based on an elicitation study. The discussion also addresses some typological consequences and modality effects in this domain.

A detailed corpus study of doubling in RSL and NGT is presented in chapter 5. We offer a unified analysis of doubling by arguing that doubling fulfills a pragmatic function.

In chapter 6, we describe our findings concerning the use of weak hand holds in the two sign languages based on a corpus study. Due to the lack of previous research on the topic, we describe the general properties and functions of this construction in RSL and NGT, and come to the conclusion that only some of its functions are related to IS.

Finally, in chapter 7, we summarize our findings on IS-marking in RSL and NGT. In addition, we address the general research questions formulated in section 1.5, that is, we compare RSL and NGT, and we discuss typological consequences and modality effects.

This dissertation is a coherent work that should be read as a whole. However, chapters 3-6 describe the outcome of separate projects, each with a topic of its own, and they can be read independently, although the reader may profit from reading chapter 2 first, as it provides useful background information.

It is necessary to note that the four subprojects within this dissertation were not conducted in the order in which they are presented as chapters. Chapters 3, 5 and 6 are primarily based on corpus data, while the data for chapter 4 were collected by means of elicitation. The

chronology of the subprojects was as follows: doubling (chapter 5) in 2011; topics (chapter 3) in 2012-2013; weak hand holds (chapter 6) in 2013; focus (chapter 4) in 2013-2014.

In addition, some of the projects constituting this dissertation are based on collaborative research. In particular, chapter 2 is based on collaboration with Roland Pfau (University of Amsterdam); chapter 4 is based on collaboration with Yassine Ellen Nauta (Radboud University Nijmegen), Anna Anatolyevna Komarova, and Tatyana Panteleevna Davidenko (Center for the Deaf Education and Sign Language, Moscow), and chapter 6 is based on collaboration with Anna Sáfár (Radboud University Nijmegen).

2. Previous research

2.1 Introduction¹¹

This chapter will present a brief overview of previous research on IS in sign languages (see Wilbur (2012) and Kimmelman and Pfau (to appear) for more details). As already discussed in chapter 1, we have decided to approach IS in RSL and NGT from two perspectives. On the one hand, we wanted to investigate the well-known IS-functions, such as topic and focus, in order to uncover their form of expression in the two languages; on the other hand, we also wanted to look at the specific markers common to other sign languages that have IS-related functions. This approach resulted in the four subprojects: the first two concern IS functions, namely topic (chapter 3) and focus (chapter 4); the other two concern IS-related formal devices, namely doubling as a modality-independent device (chapter 5) and weak hand holds as a modality-specific device (chapter 6).

It is important to notice that although both doubling and weak hand holds have been described as possible markers of IS, there are also other functions that can be attributed to these formal means. However, for RSL and NGT, these constructions have not been analyzed in detail previously; therefore, it is necessary to first describe the general properties of doubling and weak hand holds: their form and use, and only then zoom in on the IS-related functions. Consequently, sections 2.4 and 2.5 of this chapter contain information on general properties of these constructions and not only on their IS functions.

The structure of this chapter parallels the structure of the dissertation: in section 2.2, topics are discussed and in section 2.3 we turn to focus. Section 2.4 is devoted to doubling and section 2.5 to weak hand holds. The aim of each of the subsections is to summarize the main findings concerning this area of research in sign languages of the world and to formulate the research questions that will be addressed in the following chapters. These specific questions are recapitulated in section 2.6 together with more general questions addressed in chapter 7.

2.2 Topic

To date topic constructions have received more attention in the sign language literature than focus constructions. They have been subject to investigation since the early days of sign language research (Friedman 1976, Ingram 1978) due to their frequent use in ASL. More recently, they have been studied also in a wider range of unrelated sign languages: ASL (Aarons 1994, Todd 2008), Finnish Sign Language (FSL: Jantunen 2007), HKSL (Sze 2008b, 2011), ISL (Rosenstein 2001), and NGT (Coerts 1992, Crasborn et al. 2009). The data reveal that across sign languages, topic information tends to occupy a left-peripheral position in the clause; it is also often accompanied by a non-manual marker (e.g. raised eyebrows) and followed by a prosodic break. It has thus been argued that topichood in sign languages is commonly syntactically and prosodically marked. In addition, some sign languages have even been claimed to be topic-prominent, for instance, ASL (McIntire 1982), British Sign Language (Deuchar 1983), and ISL (Rosenstein 2001).

¹¹ This chapter (specifically sections 2.2 and 2.3) is partially based on Kimmelman and Pfau (to appear).

In this section, we will address the use and interpretation of topics. First, in sections 2.2.1 and 2.2.2, we will present and discuss different types of topics, focusing on semantic and syntactic distinctions that are well-known from the study of spoken languages. We then turn to the issue of non-manual marking, and the occasional absence thereof, in section 2.2.3. Finally, in section 2.2.4, we investigate the notion of topic prominence. Based on the discussion in these sections, research questions will be formulated for the study of RSL and NGT (section 2.2.5).

2.2.1 Semantics of topics

The notion of topic as defined based on spoken language research was introduced in section 1.3 and, as was mentioned there, the same notion has been used to describe certain phenomena in sign languages. Topic constituents can be linked to the preceding discourse in various ways and may include different types of information. Here we adopt the basic semantic distinction between aboutness and scene-setting topics, which is, amongst others, applied by Sze (2008b, 2011) in her study on HKSL. Although not everyone would agree that both aboutness and scene-setting topics belong to one general category of topics, the data discussed below suggest that this is a reasonable analysis for sign languages, as both types of topics are marked similarly.

It is generally assumed that an aboutness topic represents what the sentence is about. It includes information which is either familiar to the interlocutors or identifiable from the preceding context. Based on these characteristics, Sze (2011:137) identifies the fronted object INTERPRETER¹²SIGN-LANGUAGE in (1a) as the topic of the sentence; this NP is followed by a prosodic break but it is not non-manually marked (see section 2.2.3 for further discussion). The NGT example in (1b) contains a topicalized subject, AIRPLANE, which is non-manually marked. Its articulation is also prolonged by means of a final hold (Coerts 1992:223).

- (1) a. INTERPRETER.SIGN.LANGUAGE / GOVERNMENT PAY-THEM NOT-HAVE¹² [HKSL]
 ‘The sign language interpreters, the government does not pay (them).’
 top neg
 b. AIRPLANE COME NOT [NGT]
 ‘As for the airplane, it did not arrive.’

In contrast to aboutness topics, scene-setting topics provide a spatial or temporal context within which the main predication holds (Chafe 1976). They may thus involve either locative expressions or temporal information (be it expressed by adverbials, NPs, or subordinate clauses). While aboutness topics usually include discourse-old information, scene-setting topics may include both discourse-new and discourse-old information. Two examples from FSL, in which a locative expression (2a) and a temporal adverbial (2b), respectively, occupy the topic position, are provided in (2); both topics are marked non-manually (Jantunen 2007).

- (2) a. ew+er
 NIGHT CLUB IX_a / IX-1 WORK DOORMAN [FSL]
 ‘That night club, I work (there) as a doorman.’

¹² All examples are adapted to conform to the notation used throughout this dissertation. Additional notation used in this chapter: top – for non-manual topic marker; ew – eyes wide open; IX_i – pronoun referring to a referent with the (semantic) index *i*, IX_{Mary} – pronoun referring to Mary; IX_{left} – pointing to the left; [asp: cont] for continuous aspect.

- b. $\frac{\text{ew+er}}{\text{NOW EVENING / IX-1 GO PUB}} \quad [\text{FSL}]$
 ‘This evening, I (will) go to the pub.’

At the same time, the examples in (1) and (2) also illustrate an important distinction related to the thematic roles assigned by the verb. Simplifying somewhat, aboutness topics are generally arguments of the verb (object in (2a), subject in (2b)), while scene-setting topics are adjuncts (see also Crasborn et al. (2009) for a discussion of the distinction between ‘argument’ and ‘spatio-temporal’ topics). Sze (2011), however, points out that, occasionally, adverbials may also represent what the sentence is about.

To sum up, the sign languages studied to date display both types of topics (although not all authors use the same terms), and both types of topics have similar markings as well (Sze 2011).

2.2.2 Syntax of topics

Besides their semantic characteristics, different types of topics are also commonly distinguished based on their syntactic properties or, to be more precise, the extent to which they are syntactically integrated into the rest of the sentence. The crucial distinction, which was first explicitly discussed for sign languages by Aarons (1994), is that between ‘base-generated’ and ‘moved (fronted)’ topics. According to Aarons, the topic VEGETABLE in the ASL example (3a) must be base-generated in topic position, as it does not constitute an argument of the verb. Commonly, in these cases, an argument of the main clause bears a semantic relationship to the topic – in (3a) this is a relation of class membership (Aarons 1994:152). Note that the example also illustrates that topics need not be specific and definite.

- (3) a. $\frac{\text{top}}{\text{VEGETABLE / JOHN LIKE CORN}} \quad [\text{ASL}]$
 ‘As for vegetables, John likes corn.’
 b. $\frac{\text{top}}{\text{MARY}_i / \text{JOHN LIKE IX}_i} \quad [\text{ASL}]$
 ‘As for Mary, John likes her.’

Aarons also assumes that structures like (3b) involve a base-generated topic. While MARY – just like VEGETABLE in (3a) – is not an argument of the verb, it is co-referential with the pronominal index in object position. Constructions in which a topic NP is co-referential with a (resumptive) pronoun within the clause are often referred to as ‘left-dislocation’.

The example in (4a) displays different properties, as the clause following the topic NP would be ungrammatical by itself (Aarons 1994:154). According to Aarons, we therefore have to assume that the object NP MARY has moved to the topic position (SpecTopP) leaving behind a trace in its D-structure position. The movement of a noun phrase to the left periphery of the sentence is called ‘topicalization’. Aarons also provided the corresponding example with the topicalized subject JOHN (4b). In this case, only the prosody (non-manual marking and pause) indicate that we are dealing with a topic construction, as the word order is SVO. Note that it is crucial that the verb in (4) is a plain verb, as it is commonly assumed that agreeing verbs may license empty arguments (*pro*) in subject and object position; that is, in the presence of an agreeing verb, it cannot be determined whether the topic is moved or base-generated.

- (4) a. $\frac{\text{top}}{\text{MARY}_i / \text{JOHN LOVE } t_i}$ [ASL]
 ‘Mary, John loves.’
- b. $\frac{\text{top}}{\text{JOHN}_i / t_i \text{ LOVE MARY}}$ [ASL]
 ‘John, he loves Mary.’

Interestingly, Aarons points out that topicalization either selects one specific member from a set or is used for contrastive focus. Therefore, what we are dealing with here is actually focus (see the discussion in section 2.3; also see Neidle (2002), who assumed that MARY in (4a) actually occupies the specifier of a Focus Phrase). The different possible functions of fronted constituents are attested in other languages as well, including English, where they can be both topical and focal (Prince 1986).

A third type that is often distinguished in the literature are ‘hanging’ topics (sometimes also referred to as ‘Chinese-style’ topics; e.g. Todd 2008, Sze 2011). In contrast to left dislocation, a hanging topic is not co-referential with an argument of the clause following it. In contrast to topicalization, the topic NP is not an argument of the verb. Sze (2011:137) categorized the topic constituent in (5), indicated by square brackets, as a “hanging ‘aboutness’ topic”. The noun VEGETABLE in example (3a) may well be another example of this category.

- (5) [IX_{DEAF-allowance} DEAF DEAF-ALLOWANCE IX_{DEAF-allowance}] [HKSL]
 MONEY (hesitation) MONEY EVERY-MONTH HAVE
 ‘About the deaf allowance, (I) get the money every month.’

Crasborn et al. (2009) observed that, in NGT, a clause-final indexical sign that is co-referent with the topic constituent may optionally be used. Crucially, this sign is different from the (resumptive) pronouns attested in examples like (3b) above, as it does not occupy the position of the respective argument (NGT is an SOV language). The example in (6a) actually contains three pointing signs targeting the same position: the first one localizing the topic NP GIRL, the second one being a resumptive pronoun in subject position (indicative of left dislocation), and the third one appearing in clause-final position (Crasborn et al. 2009:359). In previous studies on ASL (Padden 1988) and NGT (Bos 1995), it had been argued that such clause-final pronominal signs always refer to the subject (hence the name ‘subject pronoun copy’). Crasborn et al., however, provided examples in which the final index refers to an object (6b) or a locative expression. They argue that the final index actually refers to the topic and therefore call the phenomenon ‘topic agreement’. There is no research showing that topic agreement is attested in other sign languages.

- (6) a. GIRL IX_{left} / IX_{left} BOOK THROW-AWAY IX_{left} [NGT]
 ‘That girl, she threw away the book.’
- b. BOOK IX_{right} / IX_{left} THROW-AWAY IX_{right} [NGT]
 ‘He threw away the book.’

A sentence can have multiple topics. In his study on ASL topics, Ingram (1978) pointed out that topic NPs may combine with temporal and/or locative phrases to form what he calls the ‘theme’ of the sentence. He was probably the first to observe that argument and adjunct topics

may be stacked, as shown in (7) (adapted from Ingram 1978:204).¹³ For a detailed discussion of topic stacking in ASL see Aarons (1994).

- (7) top
LONG-TIME-AGO / GIRL SMALL / DECIDE WALK IN WOODS [ASL]
‘A long time ago a little girl decided to walk in the woods.’

Crasborn et al. (2009) also discussed topic stacking focusing on the combination of argument and spatio-temporal (scene-setting) topics. They observe that, in NGT, argument topics precede spatio-temporal topics and within the latter, time specifications typically precede place specifications, as illustrated in (8) (Crasborn et al. 2009:359). Note that the left-dislocated topic PERSON is not non-manually marked (‘neutral’ expression) while the scene-setting topics are marked by head tilt – which is in line with the observation made by Sze (2011) for HKSL. Crasborn et al. also claimed that an argument topic always constitutes a prosodic unit of its own (an intonational phrase) while spatial and temporal topics may be merged into a single prosodic unit, as in (8).

- (8) neutral tilt nod neutral
IX-a PERSON / TOMORROW AT-HOME / IX-a NEWSPAPER READ IX-a [NGT]
‘The man, tomorrow at home he will read the newspaper.’

In section 3.3.1 we will discuss syntactic properties of topics in RSL and NGT. Issues such as movement vs. base generation, topic agreement, and topic stacking are all addressed there.

2.2.3 Non-manual marking

Ever since the early studies on IS in sign languages, it has been observed that topicalized constituents are commonly accompanied by specific non-manual markers. A marker mentioned in every study is brow raise; in addition, head movements are often described. Ingram (1978:204), for instance, observed that “ASL topics may be marked with the raising of the eyebrows, the tilting of the head, the twitching of a shoulder”.¹⁴ Similarly, Liddell (1980) mentioned brow raise and a slight backward head tilt for ASL. For NGT, Coerts (1992) concluded that ‘eyebrows up’ is the only non-manual feature characteristic of topics.¹⁵ Other markers mentioned in the literature include ‘eye gaze at addressee’ and ‘head nod’ (see Sze (2011:126f.) for a convenient overview of non-manual markers identified in different studies).

All of the non-manual markers discussed so far are domain markers in that they extend over a syntactic/prosodic domain. In addition, there are boundary markers. Left-peripheral topics generally constitute an intonational phrase followed by a prosodic break which is either realized as a pause or signalled by other types of markers. A non-manual marker that is frequently observed in this context is an eye blink (‘bl’) coinciding with the final hold or

¹³ The example actually comes from a study on pauses in ASL by Grosjean and Lane (1977). Ingram does not provide the non-manual marker in his gloss, but points out that the constituent GIRL SMALL carries a non-manual topic marker. The commas reflect pause durations as measured by Grosjean and Lane.

¹⁴ Ingram (1978:204) pointed out that it is “not yet known whether the choice of topic marker is determined by individual preference [...], by sociolinguistic influences, by grammatical context, or by a combination of these”.

¹⁵ Janzen (1999) argued that the non-manual topic marker (in particular, raised eyebrows) grammaticalized from a communicative questioning gesture commonly used by speakers. This non-manual co-speech gesture entered the grammar of ASL as a yes/no question marker and then developed further into the topic marker (for grammaticalization in sign languages, see Pfau and Steinbach 2011).

following the topic constituent, thus marking the prosodic boundary (Sze 2008a, Herrmann 2010), as illustrated in the DGS example in (9) (Herrmann 2010:23).

- (9) bl
 YOUR DOG / NAME WHAT [DGS]
 ‘Your dog, what was his name again?’

All of Aarons’ examples include a non-manual (domain) marker accompanying all types of topics (moved and base-generated, arguments and adjuncts). Similarly, Jantunen (2007:165) pointed out that in his FSL data, topics are always marked with eyebrow and eye position. Later research on other sign languages, however, suggests that sign languages may differ from each other when it comes to non-manual marking. Todd (2008) questioned the regularity of non-manual marking of topics in ASL. Rosenstein (2001) claimed that topics in ISL are not marked by brow raise. Sze (2008b, 2011) observed that, in HKSL, only a very small number of aboutness topics – including hanging topics, left-dislocated topics, and topical (clause-internal) subjects – are accompanied by a brow raise and/or a specific head position. Also, they are not consistently followed by an intonational break. In contrast, scene-setting topics in her data (with the exception of temporal adverbials) are much more likely to be accompanied by a brow raise, a forward head tilt, or both. In (10), the NP SECONDARY-TWO, which sets up a temporal domain, is marked by brow raise and forward head tilt (‘fht’) (Sze 2011:14).

- (10) er+fht
 SECONDARY-TWO / START PLAY-BASKETBALL / HAVE-COMPETITION [HKSL]
 FARE-BETTER-THAN
 ‘At secondary two (= grade 8), I started playing basketball and had competitions; I was better than (other senior schoolmates).’

Taken together, the data from different sign languages reveal (i) that topics are commonly, but not consistently, marked by non-manual domain and boundary markers, (ii) that different types of topics may be accompanied by subtly different domain markers, and (iii) that sign languages may differ with respect to the form and frequency of the markers employed. In sections 3.3.2 and 3.3.3 we will discuss whether these generalizations also hold for RSL and NGT.

2.2.4 Topic prominence

As mentioned in section 1.3, some sign languages have been claimed to be topic or discourse prominent, that is, it has been suggested that they are highly context-dependent and that the notion of topic is more important than the notion of subject for the grammar of these languages. Slobin (in press) went further by claiming that *all* sign languages are topic-prominent. However, from the very beginning, the issue of topic prominence of sign languages has been controversial. For instance, McIntire (1982) claimed ASL to be topic-prominent, while Liddell (1980) argued against this position. Rosenstein (2001) claimed that ISL is topic-prominent, and Jantunen (2007) analysed FSL as a discourse-oriented (and by extension, topic-prominent) language. Sze (2008), on the other hand, argued that HKSL cannot be analysed as topic-prominent.

As described in section 1.3, different researchers used different definitions of topic prominence in spoken languages. According to Li and Thompson, topic-prominent languages have a number of characteristics that distinguish them from subject-prominent languages. In

particular, topic-prominent languages lack passives and dummy-subjects; moreover, they are predominantly SOV. É. Kiss (1995) refined their definition of topic prominence and discourse orientation by focussing on the property of obligatory marking of topics. On the other hand, McShane (2005) offered different criteria of discourse-orientation, one of the most important ones being an extensive use of ellipsis.

It is of course in principle possible that some sign languages (e.g. ISL and FSL) are indeed topic-prominent, while others (such as HKSL) are not. Based on the available descriptions, however, it seems more likely that the different classifications result from the definitions used, not from the linguistic features of particular sign languages. Previous research already discussed in this section has shown that many sign languages have topic marking, although the issue of obligatoriness of this marking is far from uncontroversial. In addition, sign languages in general are also known to allow ellipsis (Sandler and Lillo-Martin 2006). However, ellipsis is not universally considered a decisive property of topic-prominent languages. Different researchers have thus come to different conclusions with respect to topic prominence of sign languages.

In order to answer the question whether RSL and NGT are topic-prominent (section 3.5), we need to establish the basic facts, namely to what degree ellipsis is permitted (section 3.4); how topics are marked; whether the marking is obligatory; how thetic sentences are formed; and whether the distinction between thetic and categorical sentences is regularly marked (section 3.5).

2.2.5 Research questions

Based on the brief overview of previous research on topics in sign languages in sections 2.2.1 – 2.2.4, it is now possible to formulate the typologically motivated research questions for the investigation of topics in RSL and NGT. The answers to these questions will not only provide a description of the basic properties of topics in these two languages, but will also allow for a more general perspective on topic marking in signed and spoken languages in general.

- QT1:**¹⁶ What are the markers of topics in RSL and NGT (including syntactic, non-manual and boundary markers), both for scene-setting and aboutness topics?
- QT2:** What is the function of marked topics (when are topics marked and when are they not marked)?
- QT3:** What is the relation between different formal markers of topics (for instance, are different markers realizing different meanings)?
- QT4:** How are thetic sentences expressed in RSL and NGT?
- QT5:** In general, what are similarities and differences between topics in RSL and NGT?
- QT6:** Can RSL and NGT be called topic-prominent?

Note that for NGT, some of these questions (QT1, QT3) have already been addressed in Coerts (1992) and Crasborn et al. (2009), but a study based on corpus data has not yet been conducted. In addition, this study will be one of the first to systematically compare topic marking in two different sign languages using the same methodology.¹⁷

¹⁶ Different abbreviations will be used for research questions addressing different issues: QT – question about topics, QF – questions about focus, QD – questions about doubling, QW – questions about weak hand holds, and GQ – general questions.

¹⁷ Dachkovsky, Healy and Sandler (2013) compared eyebrow movement and eye aperture in ISL and ASL, including the topic marking function of these non-manuals.

2.3 Focus

Although focus in sign languages has been explored in less detail than topics, the expression of focus has been relatively well studied for ASL (Wilbur 1994, 1996, Neidle 2002). Some data is also available for other sign languages, including Brazilian Sign Language (*Língua de Sinais Brasileira*, LSB: Nunes and de Quadros 2008), NGT (van der Kooij et al. 2006, Crasborn and van der Kooij 2013), and DGS (Herrmann 2013); for an overview, see also Wilbur (2012). In this section, we first address different types of focus and their syntactic marking (section 2.3.1); this will be followed by a discussion of prosodic (section 2.3.2), non-manual (section 2.3.3), and spatial marking of focus (section 2.3.4). Specific research questions are formulated in section 2.3.5.

2.3.1 Types of focus

It has been shown that different types of focus, including information focus, contrastive focus, and emphatic focus, each have a different means of expression across sign languages (Wilbur 2012). In the following subsection, we briefly describe each of the types and discuss its syntactic properties. Prosodic and non-manual marking which can also differentiate these types are discussed in sections 2.3.2 – 2.3.3.

2.3.1.1 Information focus

As discussed in section 1.3, information focus is the most basic type of focus: it is the part of every utterance that expresses new information. Another way to conceptualize information focus is as the part of the sentence that answers an (implicit) *wh*-question.

In sign languages, information focus is often not marked syntactically (Lillo-Martin and de Quadros 2008). This means that the constituent expressing information focus remains *in situ*, as in (11a), which could be an answer to the question ‘What did you read?’ However, in ASL, the focused constituent can optionally be moved to a clause-initial position – called SpecFocP in Neidle (2002) and Lillo-Martin and de Quadros (2008). The example in (11b) illustrates the co-occurrence of a left-peripheral information focus (BANANA) with a base-generated topic (FRUIT). As pointed out by Lillo-Martin and de Quadros (2008:169), this sentence could be uttered as a reply to the question ‘As for fruit, what does John like?’ (‘t-c’ = topic-comment topic, I-focus – information focus).

- (11) a. IX-1 READ BOOK STOKOE [ASL]
 ‘I read Stokoe’s book.’
 t-c I-focus
 b. FRUIT / BANANA / JOHN LIKE MORE [ASL]
 ‘As for fruit, John likes *bananas* best.’

It should be noted that a different analysis of the ASL data has been proposed by Petronio (1991) and later by Wilbur (1997). They claim that stress in ASL – unlike in English – has a fixed position: the right edge of the clause. As a consequence, the constituent in focus must either undergo rightward movement or be doubled, that is, appear once in its original position and once in clause-final position, see also section 2.4.¹⁸

¹⁸ For a recent discussion of different analyses, see Wilbur (2012).

One of the main means to express information focus syntactically is the ‘wh-cleft construction’. This strategy has been described for many sign languages, including ASL and Australian Sign Language (Auslan, Johnston and Schembri 2007). Wilbur (1996) argued that ASL constructions like (12a) should be analysed as wh-clefts, where the first clause expresses the topic and the second clause the focus of the sentence (Wilbur 1996:210).¹⁹ She provided several syntactic arguments – for instance, embedding, interaction with negation, and ellipsis – for the claim that these constructions are single sentences, and not the combination of a rhetorical question and an answer, as had previously been argued by Baker-Shenk (1983). In particular, she argued that the first part of the construction (IX-1 DISLIKE WHAT in (12a)) is a reduced relative clause, while the second part (LEE POSS TIE) is a constituent smaller than a clause conveying new information.

- (12) a. $\frac{\text{er}}{\text{IX-1 DISLIKE WHAT / LEE POSS TIE}}$ [ASL]
 ‘What I dislike is Lee’s tie.’
- b. $\frac{\text{er}}{\text{JOHN HAVE MOTORCYCLE / NO (HE NOT HAVE MOTORCYCLE)}}$ [ASL]
 ‘John doesn’t have a motorcycle.’

Recently, however, Caponigro and Davidson (2011) claimed that these constructions are not syntactically and semantically parallel to wh-clefts in spoken languages. Instead they analyzed them as clausal question-answer pairs unique to sign languages. The function of these constructions, they argued, is connected to IS, but cannot be subsumed under the traditional functions of wh-clefts. While they agreed with Wilbur in treating the whole construction as a single declarative sentence, they provided arguments against her analysis of the two parts of the construction. As for the first (question) part, they argued that it is an embedded interrogative and not a relative clause, as ASL relative clauses never contain wh-words. In addition, they showed that the question part can also be a polar question and provided evidence that the second part is a partially elided declarative clause. Example (12b), for instance, is analyzed as including a polar question in the first part and the obligatory negative reply NO in the second part; optionally the second part may include the omitted material (HE NOT HAVE MOTORCYCLE) (Caponigro and Davidson 2011:336).

Wh-clefts²⁰ are an important focus marking strategy in many sign languages. They would be a separate research project, but could not be analyzed in detail within this dissertation. They will, however, be mentioned in chapter 7 in the context of our discussion of possible modality effects in the domain of IS.

2.3.1.2 Contrastive focus

Contrastive focus occurs when the context provides overt alternatives to the alternative in focus in a particular sentence. In sign languages, contrastive foci are also often marked by topicalization (recall section 2.2). Aarons (1994), for instance, showed that, in ASL, topicalization can be used to express contrast, as illustrated in (13) (Aarons 1994:159; example slightly adapted).

¹⁹ See Wilbur (1997) for a discussion of other types of clefts attested in ASL.

²⁰ For the sake of simplicity we will continue to use the term “wh-clefts”.

- (13) JOHN_i NOT-LIKE JANE. MARY_j / IX_i LOVE *t_j*. [ASL]
 ‘John doesn’t like Jane. *Mary* he loves.’

Lillo-Martin and de Quadros (2008) also claimed that, in ASL and LSB, the constituent which is in contrastive focus is moved to the focus projection in the left periphery of the sentence. However, Wilbur (1997) suggested that a left-peripheral contrastive constituent can either be a contrastive focus or a contrastive topic. This implies that topicalization as a syntactic mechanism is used to express a variety of meanings, and not just contrastive focus. In the following chapters we will use the term *fronting* to refer to this syntactic mechanism in order to avoid the focus-form confusion.

2.3.1.3 Emphatic focus

Across sign languages, emphasis, the third type of focus, is usually connected to the phenomenon of doubling, as illustrated for the modal verb CAN in the LSB example in (14) (de Quadros 1999; cited in Nunes and de Quadros 2008:178).

- (14) IX-1 (CAN) GO PARTY CAN [LSB]
 ‘I *can* go to the party.’

This phenomenon has been described for many sign languages, including ASL, LSB, and HKSL (Sze 2008b). According to Nunes and de Quadros (2008), doubling in ASL and LSB is used to express emphasis and it surfaces when two copies of a moved constituent are overtly realized. An alternative analysis of doubling has been proposed by Petronio (1991), who connected doubling to all types of focus. In section 2.4 we will discuss doubling in detail.

In sum, all three types of focus seem to occur in the sign languages studied thus far. In chapter 4, we will discuss how information and contrastive focus are marked in RSL and NGT, based on controlled data elicitation of different focus types. In addition, chapter 5 discusses doubling (and its relation to emphatic focus) separately, based on the analysis of corpus data.

2.3.2 Prosodic/stress marking

The previous section has shown that focus can be syntactically marked in sign languages. However, in many cases, focus (especially information focus) is not marked syntactically but rather prosodically. As in many spoken languages, the focused constituent in sign languages generally has to be stressed (Wilbur 1994, 1999). Despite much discussion among researchers as to how exactly stress is realized in different sign languages, the most common features of a stressed sign are longer duration, larger movement trajectory, and higher velocity of the movement (Wilbur 1999, van der Kooij et al. 2006, Crasborn and van der Kooij 2013).

As for ASL, the claims regarding the realization of stress are quite mixed. Wilbur and Schick (1987) first posited that stressed signs in ASL are characterized by a number of different features, including body shifts, sharp sign boundaries, higher position, longer duration, larger movements, and repetition of the movement. However, they did not find one set of consistent cues. In contrast, Coulter (1990) found that stressed signs were shorter in duration and larger in size. Wilbur (1999) later confirmed her own previous results that stressed signs in ASL were longer in duration and added that they had a higher peak velocity. They were also larger in size, but this was seen as a side-effect of the lengthening.

Waleschkowski (2009) reported that in DGS stress is expressed by head nods, larger movement, longer duration, higher muscle tension, and spatial dislocation (higher position for stressed signs). Interestingly, she also found that contrastive focus is more likely to be marked by stress than information focus. For NGT, Crasborn and van der Kooij (2013) claimed that focused signs are larger and longer in duration, as a result of either adding repetitions or holds at the end of signs. For fingerspelled words, they found yet another strategy, namely the use of a higher location and sometimes the addition of a small path movement to the last letter in the word.

As discussed in section 1.3, many spoken languages use stress to express focus as well. Importantly, focus is usually not marked unambiguously. In English, for instance, object focus, VP-focus, and sentence-focus are all marked by stress on the object. This phenomenon is known as “focus projection” (cf. example (13) in chapter 1). As Crasborn and van der Kooij (2013) pointed out, there has been no research on the potential analogues of focus projection in sign languages. Focus projection in sign languages can be examined in two different domains: stress marking and non-manual marking (see the following section). As for stress marking, we do not expect sign languages to be different from spoken languages and therefore, focus projection would be expected. However, non-manual markers in general have a tendency to spread (Pfau and Quer 2012); one might therefore expect the scope of the non-manual markers to align with focus scope. These questions will be tested based on the data from RSL and NGT in chapter 4.

2.3.3 Non-manual marking

Just like topics, foci in sign languages can be marked non-manually. For instance, according to Lillo-Martin and de Quadros (2008), different types of focus (information, contrastive, and emphatic) in ASL and LSB are consistently marked by eyebrow movement and a backward head tilt. Judging by the pictures provided in their article, contrastive focus is also marked by a forward head tilt. In other sign languages, similar non-manual markers have been observed. In DGS, for instance, replacing and corrective foci (two types of contrastive foci) are marked by raised eyebrows and head tilts and movements, while information and selective foci are not consistently marked (Waleschkowski 2009). In addition, Crasborn and van der Kooij (2013) claimed that information and contrastive foci in NGT can be marked by a large number of non-manuals. In particular, all kinds of foci are characterized by eye contact between the signer and the addressee and by mouth actions; in addition, focus can be marked by body leans, head tilt, head nods, and brow raise.²¹

As mentioned above, all types of focus can be marked non-manually, often by the same markers. For instance, the non-manual marking associated with contrastive focus in ASL can be the same as the marking associated with information focus (Lillo-Martin and de Quadros 2008), but contrastive focus appears to be marked more consistently.

In addition to non-manual markers that are used to mark both topics and foci, there is a non-manual marker associated specifically with focus and contrast, namely body leans. Wilbur and Patschke (1998) found that forward and backward body leans in ASL serve to mark semantic inclusion vs. exclusion in general, and, more specifically, that they may also

²¹ Non-manual markers that are used to mark focus (such as raised eyebrows) also commonly accompany topics. In addition, in some sign languages both topics and foci can be fronted (see above). These similarities could be taken to suggest that these markers actually mark something else; Wilbur and Patschke (1999), for instance, claimed that raised eyebrows in ASL consistently mark A'-positions. On the other hand, there are also numerous differences in syntactic and non-manual marking of topics vs. foci in different sign languages (see also the rest of this section). Further research on more sign languages is required to disentangle how syntactic position and (possibly subtle) differences in non-manual marking correlate with the IS status of a constituent.

mark stress, accompany the focus particles meaning ‘even’ and ‘only’, and mark focus and contrast. According to van der Kooij et al. (2006), body leans fulfill similar functions in NGT. In particular, the focus particles meaning ‘only’ and ‘also’ are accompanied by a backward or forward lean, respectively.

Until recently, very little was known about how different non-manual markers interact with each other. Lately, however, this question is being investigated. For instance, Crasborn and van der Kooij (2013) discussed the possibility that in NGT, raised eyebrows, open eyes, and backward head tilts are all realizations of an abstract phonological feature which they have called “[open up!]”. It would therefore be insightful to study the features that can have multiple phonetic realizations and ascertain their IS-related functions.

2.3.4 Contrast in space

Some sign languages have a modality-specific strategy of expressing contrastive focus, or contrast in general, namely using contrastive spatial locations for contrasted referents. This can manifest itself simply by localizing the two contrasted referents on the opposite sides of the signing space, or the signer can add sideward body leans. For example, in NGT contrast is commonly expressed by left- vs. rightward body leans, as shown in (15), where two actions, RIDE-BIKE and STUDY, are contrasted (van der Kooij et al. 2006:1607, slightly adapted).

- (15)

<u> </u> <u> </u> <u>lbl</u> <u> </u> <u>neg</u>	<u> </u> <u> </u> <u>rbl</u>
---	---

 NO / IX-a RIDE-BIKE / IX-b ASL STUDY / IX-b [NGT]
‘No, he is not out biking, he is studying ASL.’

Another spatial strategy for expressing contrast is dominance reversal. This phenomenon is connected to the fact that signers usually use one hand more actively than the other (see section 2.5 for more details); one-handed signs are thus signed with this strong hand (also known as dominant hand²²). However, sometimes the roles of the hands are switched, and the weak (non-dominant) hand temporarily becomes more active. According to Frishberg (1985), this strategy can be applied in order to separate a topic (signed with one hand) from the comment (signed with the other hand), as in the Jordanian Sign Language (*Lughat il-Ishaara il-Urdunia*, LIU) example in (16a) (Hendriks 2007:250). But it may also serve the purpose of contrasting referents, as in the NGT example in (16b), where the referents WIFE and SON are contrasted (adapted from Crasborn and van der Kooij (2013:536)). The latter use implies that referents localized contrastively (to the right and to the left of the signer) can be signed with two different hands, leading to the dominance reversal.

- (16) a. h1: MULTI-COLOURED-COAT [LIU]
h2: BEAUTIFUL GOOD
‘The multi-coloured coat was beautiful and good.’
b.

<u> </u> <u> </u> <u>neg</u>	<u> </u> <u> </u> <u>nod</u>
---	---

 NO SON IX-a SELF IX-a [NGT]
h2: NO WIFE
‘No, it’s not my wife, it’s my son (who went to the movies).’

The fact that three related strategies – body leans, contrastive localization, and dominance reversal – are used to express contrast in sign languages may be an argument in favor of

²² The terms ‘weak hand’ and ‘non-dominant hand’ are used interchangeably here.

considering contrast a separate notion in IS, and not a subtype of focus (see section 1.4). However, Crasborn and van der Kooij (2013) have suggested that in longer stretches of discourse, these strategies can be used to mark information focus as well.

2.3.5 Research questions

Based on the research on focus in sign languages (and keeping in mind typological research on focus in spoken languages discussed in section 1.4.3), the following questions about focus in RSL and NGT will be addressed:

- QF1:** What syntactic, prosodic, and/or non-manual markers of focus are attested in RSL and NGT?
- QF2:** Do RSL and NGT differentiate different types of focus, such as information and contrastive focus?
- QF3:** Do RSL and NGT use focus projection or do they mark focus unambiguously?
- QF4:** What are the differences between RSL and NGT with respect to focus marking?
- QF5:** How do different markers of focus in RSL and NGT interact?
- QF6:** Are there modality-specific means to express focus in RSL and NGT (such as using space to express contrast)?

Note that Crasborn and van der Kooij (2013) have also addressed questions QF1, QF3 and QF5 for NGT. However, in the present study a different methodology is used (see chapter 4), which will make it possible to confirm (or contradict) their findings. In addition, as in the study of topics, this study will be one of the first to directly compare focus marking in different sign languages, namely RSL and NGT.

2.4 Doubling

Doubling was already introduced in section 2.3.1.3 as one of the possible strategies for focus marking. However, before we discuss the IS-related functions of doubling, we have to describe the formal properties of this strategy. Recall that sections 2.4 and 2.5 are different from the previous two sections because we do not directly approach IS-notions, but focus on possible means of expression of IS instead.

Doubling, as a process whereby a constituent appears in the sentence twice, is attested in spoken and sign languages. Recently, this phenomenon has received considerable attention because it allows linguists to hypothesize about basic properties of languages. From a theoretical point of view, it is a challenging phenomenon because it goes against one of the main principles said to determine language structure and use, namely economy. Producing the same constituent twice is obviously uneconomic; linguists therefore strive to find a motivation for this operation that can overrule economy. The functions that have been related to doubling in spoken and sign languages are emphasis, contrastive or non-contrastive verification. In addition, doubling can be used to “save” constructions that would be otherwise ungrammatical because of the limitations on the permitted amount of inflection or incorporation.

In this section, we first describe doubling as a morphosyntactic phenomenon with the function of saving the otherwise ungrammatical construction (section 2.4.1). In section 2.4.2 more recent accounts relating doubling to IS are discussed. Section 2.4.3 summarizes the research questions.

2.4.1 Doubling as a morphosyntactic strategy

A typical example of doubling in a sign language – in this case, verb doubling in LSB – is provided in (17). Note that the function of doubling is IS-related: the doubled verb is in focus (the sentence can be paraphrased as ‘Ann really does like ice-cream’).

- (17) ANN (LIKE) ICE-CREAM LIKE [LSB]
 ‘Ann likes ice-cream’ [Nunes and de Quadros 2008:177]

Doubling is a prominent phenomenon attested in many spoken languages (see Corver and Nunes 2007) covering most language families: Indo-European (French, Russian, Spanish), Altaic (Japanese, Korean), and Creole (Haitian Creole, Île de France Creole), among others (Kandybowicz 2006).

Even more commonly, doubling is used in sign languages. Besides LSB, doubling has been described for ASL (Fischer and Janis 1990, Nunes and de Quadros 2008), Hong Kong Sign Language (Sze 2008), Quebec Sign Language (LSQ, Pinsonneault 1994), Croatian Sign Language, Austrian Sign Language (Šarac, Schalber, Alibašić Ciciliani and Wilbur 2007), RSL (Shamaro 2008), Polish Sign Language (Filipczak and Mostowski 2013), and Jamaican Sign Language (Cumberbatch 2013).

In some of the studies of doubling in both spoken and sign languages, the phenomenon has not been connected to IS at all. Since we are going to analyze doubling in RSL and NGT for the first time, it is necessary to be aware of non-IS-related accounts of doubling as well; therefore, they are briefly summarized here.

In one of the earliest studies discussing the phenomenon, Fischer and Janis (1990) claimed that verb doubling in ASL occurs when the verb would otherwise become too heavy, namely when an overt object is present and the verb is either inflected for aspect (18a) or contains a classifier (18b).

- (18) a. S-H-E LISTEN R-A-D-I-O LISTEN^[asp: cont] HEAR! SAY WATER.FLOW, THROUGH [ASL]
 ‘While she is listening to the radio, she suddenly hears that there will be a flood.’
 [Fischer and Janis 1990:281]
 b. ELIZABETH EAT R-I-C-E EAT-WITH-CHOPSTICKS [ASL]
 ‘While Elizabeth is eating her rice with chopsticks...’
 [Fischer and Janis 1990:284]

This proposal implies that ASL is subject to certain limitations as to the amount of grammatical information that can be expressed within one clause.

According to Liddell (2003), some inflected forms of transitive verbs (for instance, durative aspect) are intransitive syntactically. Therefore, when such verbs take an object, doubling occurs so that the object is expressed in a separate clause with a transitive verb that is not inflected for aspect, as in (18a) where LISTEN R-A-D-I-O would belong to the first clause, and LISTEN^[asp: cont] would be the second clause.

Note that similar accounts of doubling have been proposed for spoken languages as well. For instance, in German, an NP can be topicalized for pragmatic reasons, but if the NP contains the negative indefinite determiner *kein*, only the non-negative part of it is topicalized, while the rest is left stranded (19a,b). In order to save the phonologically impossible derivation, that is, the derivation in which only the negative part of the determiner is stranded (19b), the lower copy of the negative determiner is pronounced (19c) and thus part of the determiner (*einen*) is doubled (Cheng and Vincente 2008).

- (19) a. Sie kennt [keinen alten Professor]. [German]
 she knows NEG old professor
 ‘She does not know an old professor’
 b. *Einen alten Professor kennt sie [k-].
 a old professor knows she NEG
 c. Einen alten Professor kennt sie [keinen].
 a old Professor knows she NEG

Returning to doubling in ASL, Fischer and Janis (1990) also noticed that the limitations on the amount of grammatical information cannot account for all the ASL data. For instance, in (20) the verb is marked for aspect and is followed by an object; however, no doubling occurs. They claim that doubling has an additional function of subordination. A comparison of examples (18a) and (20) reveals that in (18a), the clause with doubling is subordinate, while in (20) it is not.

- (20) S-A-L-L-Y LISTEN^[asp: cont] R-A-D-I-O [ASL]
 ‘Sally listened to the radio for a long time’ [Fischer and Janis 1990:282]

Kegl (1985) discussed limitations on the number of arguments that can be incorporated into the verbal stem (by means of a location or a classifier) and suggested that in order to incorporate additional arguments, the verb can be doubled, splitting the incorporation burden between the two occurrences. For instance, the verb HIT in ASL can incorporate a maximum of two arguments, either the subject and object, or an instrument and an object. In order to incorporate all three, the verb is repeated with different arguments incorporated (21): in the first clause, the subject and the object are incorporated, and in the second clause the object and the instrument.

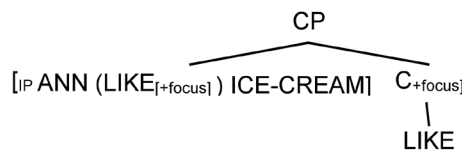
- (21) CL:HIT-PERSON, 3-CL:FLAT.OBJECT-HIT.IN.HEAD [ASL]
 ‘Hit someone in the head’ [adapted from Kegl 1985; cf. Fischer and Janis 1990:291]

To sum up, doubling in ASL (as well as in spoken languages) has been associated with grammatical constraints: a potentially ungrammatical structure is saved by applying doubling.

2.4.2 Doubling and Information Structure

The previous section sketched syntactic analyses of doubling. However, it has been noticed by researchers of both sign and spoken languages that doubling has IS-related function. In particular, doubling is used to express focus, emphasis and affirmation in different languages. This type of analyses has been applied to ASL as well.

Petronio (1993) was one of the first to relate doubling to IS. She studied doubling in ASL and claimed that doubling occurs because of focus. In particular, she argued that the second occurrence of the doubled element is base-generated in the C-head (which she assumed to be on the right in ASL) marked with the [+Focus] feature (22). Thus, the constituent that is doubled occurs both in its “normal” (preverbal) syntactic position and in the C-head to express focus meaning.



- (22) ANN (LIKE) ICE-CREAM LIKE [ASL]
 ‘Anne likes ice-cream’ [Petronio 1993; cited by Nunes and de Quadros 2008:179]

Nunes and de Quadros (2008) reanalyzed the same phenomenon in ASL and LSB in light of more recent theoretical accounts. They also claim that doubling in these languages is used to express focus, but rather than expressing all types of focus, this construction is used to express emphatic focus (23a).

In the spirit of Nunes’ (2004) copy theory of movement²³, they claimed that doubling marks emphasis and that the doubled element moves to the head of the Emphatic Focus Phrase (E-FocP) in these languages (which, in their analysis, is located in the left periphery of the clause). Subsequently, the rest of the clause is moved to SpecTopP by remnant movement. Both copies of the doubled element are pronounced because the copy in E-Foc° fuses with the focus morphology, thus becoming distinct from the original copy. The doubled constituent is therefore emphatically focused. Fusion of the verb with the focus morphology, however, is an optional process, and therefore emphatic doubling is optional. The derivation of (23a) is represented in a bracketed structure in (23b).²⁴

- (23) a. IX-1 LOSE BOOK LOSE [ASL, LSB]
 ‘I lost the book’ [Nunes and de Quadros 2008:180]
 b. [TopP [TP IX-1 LOSEⁱ BOOK]^k [Top’ Top [EFocP #LOSEⁱ-E-foc# [TP IX-1 LOSEⁱ BOOK]^k]]]

Note again that very similar accounts of doubling have been proposed for spoken languages. For example, according to Martins (2007), in European Portuguese, verb doubling occurs to express affirmation (23a): the sentence with doubling can only be used as an affirmative answer to a negative question or as an affirmative reaction to a preceding negative statement. The concept of affirmation is related to the notion of focus. In technical terms, it occurs when the verb is fused with the head of the affirmative phrase ΣP, as is shown for (23a) in the bracketed structure in (23b).

- (24) a. Ele comprou o carro, comprou. [European Portuguese]
 He bought the car bought
 ‘He did buy the car.’ [Martins 2007]
 b. [CP [ΣP ele comprou_i o carro]_k [C’ [C comprou_i] [ΣP ~~ele~~ [~~Σ’~~ [~~TP~~ [~~T’~~ [~~VP~~ [~~ele~~ comprou_i o carro]]]]]]]]_k]]

For other sign languages, generally no detailed formal analysis of doubling is offered. Sze (2008) mentions that in HKSL doubling for emphasis (emphatic focus) is also present, as in (25), but does not provide a syntactic analysis.

²³ The formal analysis briefly presented in this paragraph is not directly relevant for the current research; however, it constitutes the core of Nunes and de Quadros (2008) and is therefore presented here for the sake of completeness. The same applies to the analysis of European Portuguese in the following two paragraphs.

²⁴ #LOSEⁱ-E-foc# stands for fusion of a copy of LOSE with the emphatic focus head.

- (25) NEVER IX-1 SEE NOW NEW RECENTLY IX-1 SEE NEVER [HKSL]
 ‘I have never seen (this kind of reference books) before.’ [Sze 2008b:192]

According to her, any element (she mentions modals, entire predicates, adjectives, and adverbs) can be doubled. She points out that the doubled element should always be a part of the new information, but did not study this phenomenon in any detail.

In section 2.4.1, syntactic non-IS-related accounts of doubling have been discussed. The main idea underlying most of the accounts was that doubling is used to save a syntactic structure that would be ill-formed otherwise. In this section, we have seen accounts that describe syntactic properties of doubling but connect them to the IS-functions (mainly, focus). However, these accounts have hardly ever been compared to each other.

The only exception to this is Shamaro (2008) who investigated doubling of predicates in RSL and came to the conclusion that doubling occurs for pragmatic reasons. According to her research, doubling in RSL cannot be accounted for in morphosyntactic terms (such as saving a syntactic structure), but is rather related to the limitation on the expression of one piece of new information per intonational unit. Her proposal will be dealt with in detail in section 5.4.

To sum up, doubling has been claimed to have the function of (general) focus, emphatic focus and affirmation in both spoken and sign languages. Therefore, it is instructive to analyze doubling in RSL and NGT in order to find out its IS-related functions. However, in section 2.4.1 we discussed non-IS-related analyses of doubling. These analyses should be taken into account as well and compared to the IS-related analyses for RSL and NGT.

2.4.3 Research questions

Previous research has shown that doubling is a phenomenon common to many sign languages, as well as to some spoken languages. However, as we have seen, different researchers offer different analysis of doubling for these languages. Therefore, the following questions will be addressed:

- QD1:** What are the formal properties of doubling in RSL and NGT? What kinds of constituents can be doubled?
QD2: What are the functions of doubling in RSL and NGT? Are they related to IS?

In addition, we have seen that doubling is used in many sign languages. Although it is also present in spoken languages, we hypothesize that spoken languages use doubling in a more restricted way. Based on this hypothesis, another research question can be formulated:

- QD3:** Is doubling prominent in RSL and NGT, as in other sign languages? If so, why?

2.5 Weak hand holds

Another formal device related to IS is weak hand holds (see also section 2.3.4 where the term ‘weak (non-dominant) hand’ has been introduced). Sign languages differ from spoken languages in having two main articulators, the two hands. By virtue of the fact that the hands (and arms) are visible, symmetrical, and independently movable, this modality-specific characteristic of sign languages provides more possibilities for simultaneous expression compared to the vocal-auditory tract used to articulate spoken languages.

The fully simultaneous articulation of several signs, although possible in principle, is for the most part restricted to poetry and word play (Crasborn 2006). However, in casual signing,

most sign languages described so far are reported to make use of simultaneous manual holds. That is, the two hands do not move simultaneously; rather one sign is articulated first (by one or both hands) and then one (the strong) hand continues signing while the other (the weak) hand maintains the end state of the first sign. For instance, in example (26) from Swedish Sign Language (SSL), the signer holds the pointing sign IX ‘she’, articulated by the weak hand, while signing the rest of the sentence with the other hand (adapted from Nilsson 2007:171).

- (26) h1: WOW STRANGE CHILDHOOD TOO [SSL]
 h2: IX-----
 ‘She had a really strange childhood, too.’

This example also demonstrates that holds can have an IS-related function. In this case, the referent of IX ‘she’ is a discourse topic (see section 1.4), and its topical status is emphasized by the hold. As we will show, for many sign languages, researchers have attributed IS-related functions to weak hand holds. Therefore, it will be insightful to analyze weak hand holds in RSL and NGT.

Note again, that as with doubling, we approach weak hand holds from the formal perspective. We expect weak hand holds to have IS-related functions in RSL and NGT. However, in order to find this out, general properties of holds in these languages have to be described. Therefore, in this section we also mention research on weak hand holds that are not IS-related, and in chapter 6 we devote a considerable amount of space to describe form and functions of weak hand holds in general.

In section 2.5.1, we discuss previous research on weak hand holds. In section 2.5.2, we address the relation between weak hand holds and IS. Section 2.5.3 summarizes the unresolved issues in the study of weak hand holds. In section 2.5.4, our research questions are formulated.

2.5.1 Form and function of weak hand holds

Weak hand holds, and in general simultaneous constructions in sign languages, have received considerable attention from researchers over the last two decades. Here we will only discuss some of the most important contributions (for a more detailed review see Vermeerbergen, Leeson and Crasborn 2007).

The first peak of interest in the topic of manual simultaneity was in 1994, which marks the publication of several papers. Miller (1994a, 1994b) discussed manual simultaneity in LSQ. In his first paper, he identified the following formal types of simultaneous constructions in LSQ (Miller 1994a):

1. index sign simultaneous with other signs
2. perseveration of a previous sign
3. enumeration sign
4. fully simultaneous articulation

He came to the conclusion that the main function of simultaneous constructions was to background information: the fore-grounded piece of information is presented on the strong hand, while the backgrounded information is held on the weak hand. Note that this is related to IS: weak hand holds are hypothesized to structure the information according to its importance, although the most common notions of topic and focus are not applied here.

However, from the very beginning of research on weak hand holds, it became clear that their functions are not limited to IS. For instance, Engberg-Pedersen (1994) analyzed simultaneous constructions in Danish Sign Language, focusing on simultaneous constructions involving classifier predicates. She identified several functions of simultaneity, including expressing spatial relations between referents (which she considers the central type of simultaneous constructions), backgrounding of information (similar to Miller's suggestion for the function of holds), and expressing morphological relations.

A few years later, Miller (2000) proposed a more elaborate analysis of weak hand holds in LSQ. He claimed that weak hand holds can be classified into the following categories according to their functions and forms:

1. Locative constructions
2. Holds of verbs or predicative adjectives to encode simultaneous events
3. Holds of nouns to encode topical elements
4. Holds of pronominals and determiners to encode a syntactic relationship (between a subject and a predicate or a determiner and a noun)
5. "Oppositive/synthetic" constructions to encode contrast between elements

Miller used this classification to argue that a syntactic account of holds should be developed. He hypothesized that sign languages may have a procedure of linearization different from spoken languages and that simultaneous constructions may derive from the notion of c-command (for a related proposal see section 6.6).

While the analyses of Miller and Engberg-Pedersen focused on syntactic processes and various functions of holds, other authors offered a prosodic perspective on some weak hand holds. Nespor and Sandler (1999), for example, argued that in ISL weak hand holds happen at the level of the phonological phrase. For instance, pronouns (pointing signs) form one phonological phrase with the predicate, so the weak hand of the predicate can spread regressively or progressively over the pronoun. A similar proposal within a slightly different model of sign language phonology is offered in van der Hulst (1996). More recently, Brentari and Crossley (2002) analysed data from ASL in similar terms and came to the conclusion that weak hand holds are indeed indications of prosodic boundaries, although not only of phonological phrases but of larger units as well.

Perhaps the most widely known work on weak hand holds is the analysis of Liddell (2003, Liddell, Vogt-Svendsen, and Bergman 2007), who emphasized the role of holds in the structuring of discourse. He introduced the now widely used notion of "buoys": formally defined weak hand holds which have discourse-related functional properties. He suggested the following types of buoys:

1. *Pointer buoys* are holds of pointing signs used to emphasize important referents, as in example (26).
2. *List buoys* occur when the fingers of the weak hand are associated with referents and the hand is used for enumeration.
3. In the case of *theme buoys*, an index finger extended upwards is held to highlight the importance of a part of discourse.
4. *Fragment buoys* occur when other types of signs are held; no specific function is attributed to this type of buoys. They are therefore similar to holds discussed in Nespor and Sandler (1999) and Brentari and Crossley (2002)
5. *Depicting buoys* are part of a depicting space.

The list of buoys has been extended in Vogt-Svendsen and Bergman (2007) with the description of *point buoys*, where a pointing sign serves as a locative or temporal anchor. Mesch and Wallin (2013) proposed yet another kind of buoys, namely a DELIMIT buoy which is used to express the relation between an inner and an outer element.

2.5.2 Weak hand holds and Information Structure

The previous section has summarized existing analyses of weak hand holds. Different approaches have been used: some analyze the formal side of weak hand holds, that is, what kinds of signs are held. Others look at functions of holds. In addition, some researchers focus on the prosodic properties of holds. Let us recapitulate what IS-related functions have been attributed to this strategy.

If we look at Miller (2000)'s approach, two of the functions of holds are IS-related. Firstly, nouns can be held to express their topical status. Secondly, in the oppositive construction, holds are used to express opposition, in other words, contrast. In his earlier approach, Miller (1994a) claimed that weak hand holds in general express backgrounded information, and this is also one of the functions identified by Engberg-Pedersen (1994).

According to Liddell (2003), all buoys have an IS-related function in the broad sense: they are used to structure the discourse. More precisely, pointer buoys can be described as expressing topical elements and theme buoys as expressing relevance of the information on the strong hand. It is, however, not exactly clear how the other kinds of buoys are related to IS.

In addition, recall that in section 2.3.4 dominance reversal has been described. Dominance reversal typically also involves a weak hand hold, so the functions attributed to dominance reversal should be alluded to here. As mentioned previously, it can be used to separate topic from focus (Hendriks 2007) and to express contrast (Crasborn and van der Kooij 2013).

In order to find IS-related functions of weak hand holds in RSL and NGT, it is necessary to study this phenomenon in general, describing the form of holds and the patterns of use of this strategy. Therefore, chapter 6 of this dissertation will not immediately focus on the Information Structural notions, but will describe different functions of holds instead. In the following section, we describe what issues should be addressed in a study of weak hand holds.

2.5.3 Unresolved issues

Despite having provided valuable insights into the nature of weak hand holds, the research reported in the previous sections has some shortcomings. Firstly, most of the papers discussed above focus on prototypical examples only and contain no information on frequency of the described phenomena. The only exception to this is Nilsson (2007), who offered a quantitative analysis of the behaviour of the weak hand in a 10-minute monologue in SSL. However, information on frequency is crucial for a comprehensive analysis of weak hand holds. Frequency information can clarify differences between different types of holds, some of which might be central while others may be marginal. Besides that, cross-linguistic differences in the use of weak hand holds may also be found in the frequency of weak hand holds of various types.

Furthermore, quite often the focus of the research is on either the form or the function, without making the direct connection between the two. For instance, Liddell's classification is based primarily on the lexical source of the signs, therefore missing the variety of functions that holds of a similar form might have.

In addition, to our knowledge, the relationship between different types of discourse and the use of holds has not been investigated so far. Due to the complexity of simultaneous constructions, it is reasonable to expect that planned and spontaneous discourse may differ in the frequency of weak hand holds: the former is likely to contain more holds. Furthermore, there may be differences between types of discourse that make extensive use of the iconic possibilities inherent in sign languages, for example in the use of space to describe space (e.g., Emmorey, Tversky and Taylor 2000) or demonstrating the actions of characters in a narrative (e.g., Dudis 2004), and types of discourse that rely less on classifier constructions and constructed action. Narratives and informative discourse have been found to differ in the frequency of use of such constructions (Sallandre 2003, Sáfár et al. in press), but it remains to be seen whether the use of different types of weak hand holds interacts with discourse type.

Finally, except for the study by Liddell, Vogt-Svendsen, and Bergman (2007), we are not aware of studies that would offer a direct cross-linguistic comparison of the types of weak hand holds. From the short overview above one might conclude that most sign languages use the same types of holds in similar ways. This conclusion might even be correct, but it has hardly been tested, especially taking into consideration that frequency information is lacking in previous research. It might turn out that different sign languages do have different kinds of holds, or that they use holds with different frequency.

One question that is barely addressed in the literature is the syntactic analysis of weak hand holds. The main challenge that weak hand holds present to a syntactician is their simultaneous nature. Whereas spoken languages have hierarchical syntactic structure that is turned into linear sentences, sign languages are not entirely linear due to manual and non-manual simultaneity in general and weak hand holds in particular. Woll (2007) briefly discussed this issue and commented on the fact that linearization rules (that is, the rules by which hierarchic syntactic structures are turned into linear speech) may be different in sign languages due to the dual nature of the articulators. However, a comprehensive analysis of syntactic structures of weak hand holds or of the rules of linearization is not available yet. An attempt for such an analysis for RSL and NGT is offered in section 6.6.

2.5.4 Research questions

Based on the previous research, the following questions have been formulated:

- QW1:** What are the properties of weak hand holds in RSL and NGT with respect to lexical source, phonological form, and functions? What are the IS-related functions of weak hand hold?
- QW2:** What is the frequency of holds in (semi-) spontaneous discourse?
- QW3:** What are the differences between holds in RSL and NGT?
- QW4:** What are the differences between different genres?
- QW5:** What are the syntactic properties of weak hand holds in RSL and NGT? How does linearization work for these structures?

A comparison between RSL and NGT is theoretically important for the enterprise of identifying and characterizing modality effects in the domain of IS that distinguish signed and spoken languages (Sandler and Lillo-Martin 2006). Weak hand holds are obviously a modality-specific phenomenon, and they can be used to express IS. However, they are also a test case which allows us to study in more detail the ways in which sign languages exploit the affordances of the modality.

2.6 Summary

In this chapter, we have briefly presented the results of previous research on Information Structural categories and on some formal markers of IS in sign languages. In addition, we formulated the research questions that will be answered in the following chapters.

For the two main IS notions – topic and focus – our aim is in the first place to describe how these categories are marked in RSL and NGT. We scrutinize what the formal markers of topic and focus are, and how they interact with each other (recall questions QT and QF formulated above). Apart from the purely descriptive questions, RSL and NGT data will help us make some typologically relevant generalizations. For instance, we will discuss whether RSL and NGT can be considered topic-prominent (QT6). In addition, we will investigate whether contrast and focus can be considered separate categories in these languages (QF3).

The second half of this dissertation is devoted to formal devices that have been claimed to have IS-related functions in other sign languages: doubling and weak hand holds. We will investigate whether these strategies are also employed in RSL and NGT and whether their functions are indeed related to IS (questions QD and QW).

Each of the following chapters (3-6) constitutes a separate research project with a separate set of research questions. However, in chapter 7, we will synthesize the results to answer the general research questions (GQ) concerning IS in RSL and NGT which have already been formulated in chapter 1, and which address the following issues.

GQ1: How is IS expressed in RSL and NGT?

GQ2: What are the similarities and differences between RSL and NGT in this domain?

GQ3: What are the typological consequences of the RSL and NGT data?

GQ4: What modality effects can be identified in the domain of IS in RSL and NGT?

The first question will be answered in chapters 3-6 and the various answers will be brought together in chapter 7. The second question will also be partly answered throughout chapters 3-6. However, in chapter 7, we will summarize all the differences and similarities in order to provide a comprehensive picture. Clearly, this question is directly related to the third and fourth question. If RSL and NGT turn out to be similar, this might either be explained by them belonging to the same typological group (maybe, the group of Western urban sign languages (Zeshan 2008)), or by the fact that they both belong to the visual modality. If they turn out to be different (in some respects), this will help us establish a typology of sign languages in this domain.

The third question is not limited to comparing NGT to RSL. More generally, RSL and NGT might well turn out to display some typologically unusual features, or, on the contrary, turn out to be typologically “ordinary” when it comes to the expression of IS.

The fourth question is the most challenging. It is not really possible to argue that some property is the consequence of the language modality, just because it is attested in two sign languages (Meier 2002): in order to make such claims, data from many (and preferably all) sign languages should be compared to data from (again, preferably all) spoken languages. Some phenomena are trivially modality-specific, such as weak hand holds and the use of space to mark contrast; however, the most interesting question is whether some more subtle properties of IS in RSL and NGT can be connected to the visual modality as well. We will discuss some such possible properties in chapter 7.

3. Topic

3.1 Introduction

The main purpose of this chapter is to describe the form and function of topics in the two languages under consideration, Russian Sign Language (RSL) and Sign Language of the Netherlands (NGT). The data come from a small-scale corpus study. In analyzing strategies for topic marking, we will consider syntactic and non-manual marking, as well as prosodic boundaries that usually accompany topics. In addition, topic shift and its relation to non-manual marking of topics will be discussed. Sentences containing topics are compared to thematic sentences, and based on this comparison a discussion of topic prominence of these languages is presented.

Before presenting the data, we will recapitulate the main notions for the reader's convenience. The central notion of this study is "topic" (see sections 1.4 and 2.2 for a detailed discussion). In addition, it is useful to distinguish two kinds of topics: aboutness topics and scene-setting topics (Sze 2008). Aboutness topic is what the sentence is about (Reinhart 1982). Most typically, aboutness topics are noun phrases (arguments of the verb), and basically the sentence adds information about the referent of these noun phrases. On the other hand, scene-setting topics are time or place descriptions that set the scene for the event described by the sentence. Not all researchers agree that scene-setting topics are in fact topics, and thus use a different term, namely "frame setting" (Krifka 2008). However, as the data from HKSL (Sze 2008) show (section 2.2), sign languages provide an argument for the existence of a general category of topics, further divided into aboutness and scene-setting topics.

Furthermore, the term "topic" (both aboutness and scene-setting), as used in this chapter, refers to the function of a constituent, not to its form. For instance, the object *Bill* in 'John sees Bill' can be the aboutness topic in the appropriate context; however, it is not marked as such. A marked topic is a topic that is marked syntactically, prosodically, and/or morphologically. For instance, *Bill* is the (syntactically and prosodically) marked topic in the sentence 'Bill, John sees.'

Note also that in this section, we do not discuss the notion of *discourse topic* which is also relevant for both RSL and NGT (section 1.4). This notion is further described in chapter 6, because the realization of this notion involves weak hand holds.

A detailed discussion of existing research on topics in sign languages was already presented in section 2.2 (see also Kimmelman and Pfau (to appear)). This chapter extends this work to an analysis of topics in RSL and NGT, striving to answer the following research questions (introduced in section 2.2.5):

- QT1:** What are the markers of topics in RSL and NGT (including syntactic, non-manual and boundary markers), both for scene-setting and aboutness topics?
- QT2:** What is the function of marked topics (when are topics marked)?
- QT3:** What is the relation between different formal markers of topics (for instance, are different markers realizing different meanings)?
- QT4:** How are thematic sentences expressed in RSL and NGT?
- QT5:** In general, what are similarities and differences between topics in RSL and NGT?
- QT6:** Can RSL and NGT be called topic-prominent?

In the following section, the methodology is presented. In section 3.3, topic marking is discussed, followed by a discussion of the notion of topic shift and the correlation between topic shift and marking of topics (section 3.4). Section 3.5 addresses thematic sentences, and section 3.6 topic prominence. Section 3.7 concludes the chapter.

3.2 Methodology

First, the data collection will be described (section 3.2.1) and then the participants (section 3.2.2). Finally, the procedure of topic identification is presented and the methodological decisions made are outlined (section 3.2.3).

3.2.1 Data collection

This chapter is based on the analysis of two small corpora: one of NGT and one of RSL. Each corpus contains approximately one hour of signing. The NGT corpus we put together for this study represents a part of the Corpus NGT (Crasborn, Zwitserlood and Ros 2008, Crasborn and Zwitserlood 2008). Two types of signed texts were selected. First, the signers had to watch four episodes of the *Canary Row* cartoon (Freleng 1950). The whole cartoon consists of eight separate episodes, which the signers watched and retold in sign language one by one alternating between the roles of the speaker and the addressee. Second, the signers were asked to tell personal stories. Each signer was supposed to tell two or three stories lasting two to three minutes each.

The RSL corpus was collected by the author in 2011 in Moscow, Russia. In order to make the corpora comparable, the same two kinds of tasks were used: the *Canary Row* stories and personal stories. There is a slight difference in the organization of the recording between RSL and NGT. In the RSL corpus, one signer in a pair watched the first four episodes one by one and told them to the other signer, who had not seen them, and then the second signer watched and told the second four episodes; in contrast, in the NGT corpus, the signers were alternating after each episode. The same applies to the personal stories: in RSL, but not in NGT, one signer was asked to produce several stories in a row, and then the second signer did the same.

The RSL texts were annotated and analyzed by the author. Glossing was done with the help of two native signers of RSL. Personal stories from the NGT corpus had already been glossed by the Corpus NGT team (only sign-by-sign glossing). The *Canary Row* stories in NGT were glossed by the author with the help of one native signer of NGT. After having glossed the texts, they were annotated in ELAN software on multiple tiers, including tiers for IS, activation status, and tiers for non-manual markers such as eyebrow raise and head tilt.

3.2.3 Participants

The NGT data were made up of signed texts from 15 signers mainly from the Amsterdam region. Five of the signers had been exposed to NGT from birth, and nine of the remaining ten signers had started learning NGT before the age of five years. The mean age of signers is 53, ranging from 17 to 81 years. The sociolinguistic properties of the NGT signers based on the metadata available from the Corpus documentation are summarized in table 3.1. The Corpus NGT does not contain detailed information such as deaf signing relatives, so this information is only available for RSL signers (see table 3.2 below)

Table 3.1. Characteristics of NGT signers participating in the study

Signer	Sex	Age	Age of exposure	Region
1	male	69	0	Amsterdam
2	female	81	2;6	Amsterdam
3	female	63	0	Amsterdam
4	female	77	0	Amsterdam
9	female	30	14	Rotterdam
10	female	35	3	Amsterdam
11	male	39	0	Amsterdam
12	male	39	0	Amsterdam
47	female	59	4	Voorburg
71	male	45	2	Amsterdam
72	female	66	2	Amsterdam
73	female	17	1	Amsterdam
74	female	43	2;6	Amsterdam
83	female	64	2	Amsterdam
84	female	67	5	Amsterdam

Table 3.2. Characteristics of RSL signers participating in the study

Signer	Sex	Age	Age of exposure	City of schooling	Deaf relatives
10	female	30	0	Moscow	mother, father, aunts, uncles, grandparents
12	female	50	0	Moscow	mother, father, sister, husband, son
16	female	29	0	Moscow	mother, husband, sons, daughter, niece
18	male	58	3-4	Moscow	wife, son
19	male	55	0	Moscow	father, mother, sister, uncle, aunt, niece
20	female	41	0	Moscow	father, mother, husband son, daughter

For the RSL corpus, data from six signers were collected. The mean age of the signers at the time of recording was 45 years, and the range was from 30 to 58 years. Two of the signers are male, and four are female. All signers are deaf and have deaf relatives. They all come from Moscow and have lived and worked in Moscow for their whole lives. The sociolinguistic properties of the RSL signers are summarized in table 3.2. The table makes it clear that five of the six signers can be classified as native signers.

The group of NGT signers is larger and more varied in their sociolinguistic background than the group of RSL signers. In addition, less information is available about the NGT signers: the presence of deaf or hard of hearing relatives is only known for RSL signers. Due to the difficulty of collecting corpus data, it was impossible to make the RSL corpus directly

comparable to the NGT corpus. Although we are not going to use sociolinguistic information in the further analysis, the reader should be aware that some of the differences between languages might be attributable to the differences in language background of the signers.

3.2.3 Identifying topics

The question of topic identification is not only methodological, but also theoretical, as the notion of topic is a rather vague and debatable one (see sections 1.3 and 2.2). There is therefore a two-way dependency: on the one hand, findings are dependent on the definition of topic used, but on the other hand, the findings can also be relevant for (re)defining the notion of topic. In this section, we will summarize some of the controversies concerning the characterization and identification of topics, and we will detail the decisions that have been taken in the present study.

As mentioned in section 3.1, an (aboutness) topic is often defined as the constituent referring to the object that the sentence is about (Reinhart 1982). As Reinhart herself showed, this definition is not helpful when it comes to the identification of topics. However, Reinhart listed some other aspects of topics that can be used for identification, specifically, the fact that topics have to be given (i.e. express old information), although not all old information in the sentence has to be marked as a topic.²⁵ However, other researchers (Lambrecht 1994, Smit 2010, Gundel 1998) do not agree. Lambrecht (1994) proposed that there is a dependency between givenness and topicality, namely that constituents bearing old information are the most acceptable topics, while constituents bearing brand-new information are the least acceptable, but this does not exclude the existence of new topics. In Smit's (2010) work, the notion of topic is actually compatible with the notion of focus: both can combine to express some of the information-structural meanings. Therefore, the question whether topics can be new information remains open.

It is also known that subjects are the most common topics (Gundel 1988). Sze (2008), for instance, used this in her procedure of topic identification in HKSL: if a sentence contained both a subject and an object that both constituted old information, she considered the subject to be the topic. Obviously, however, even in such a situation, the object might well also be the topic.

Nevertheless, if we allow aboutness topics to be new information, and do not give priority to subjects as topics, we are left with a very imprecise definition of topicality, based on the vague notion of aboutness only. It is, however, impossible to tell exactly what the sentence is about. This is even more problematic when corpus data are analyzed, as we have no access to the minds (intentions) of the signers. Consequently, the view of the researcher on what the sentence is about might be quite different from the view of the signer.

For aboutness topics, functionally prototypical topics, namely subjects that are old information, were identified. However, in sentences where the object was old information and the subject was new information, the object was analyzed as the topic (following Sze 2008). Having established means for the identification of prototypical topics, it was possible to turn to the formal side, namely to topic marking. As will be discussed further in section 3.4, prototypical aboutness topics can be marked by syntactic and prosodic means, including non-manual markers. Only prototypical topic marking is described and analyzed in this

²⁵ There are also some researchers who claim that the notion of topic in general is superfluous because all IS-related phenomena can be described in terms of givenness and saliency (Slioussar 2007). This is a controversial issue in the field of IS research that cannot be addressed here. However, see Dyakonova (2009), who considers the same phenomena as Slioussar (2007), namely, word order and prosody in Russian, to argue that "topic" and "focus" still are necessary notions.

section. Once the topic marking devices have been established, it is also possible to ask whether marked topics in RSL and NGT can be non-prototypical, for instance, whether there are any new information topics (see section 3.3.5).

However, there remains the issue of zero topics. In sign languages, arguments in the sentence are commonly omitted, and it is plausible that the omitted argument is the topic, as it is very common for old information to have zero expression. Furthermore, if there is a transitive predicate, both arguments of which are omitted, there is no way to tell which of the two is the topic, but it is clear that the topic of the sentence is zero, given that both potential topics are omitted.

For scene-setting topics, the situation is also complicated. It is known that scene-setting topics can be (and very often are) new information. The only clue that can be used to identify scene-setting topics is their meaning: they are time or place descriptions. Yet it is also clear that not all time and place descriptions are scene-setting topics – otherwise the definition would be vacuous.

A procedure similar to that used for the identification of aboutness topics was applied to scene-setting topics. All place and time descriptions were marked as scene-setting topics and then, considering syntactic and non-manual markers and prosodic boundaries, we investigated whether they mark some of the scene-setting topics.

Based on the methodology described above, it is possible to discuss markers of topics in RSL and NGT. In the following section, these markers are described, while in section 3.4 topic shift as a factor influencing overtness of topics and the presence of non-manual markers will be discussed.

3.3 Topics and topic marking

In this section, first the general manual syntactic markers of topics in RSL and NGT will be discussed (section 3.3.1). The discussion then turns to non-manual markers, namely eyebrow movement and head tilts as the main markers of topichood (section 3.3.2) followed by the issue of marked topics in the absence of non-manual markers and the analysis of sentences with role shift and its relation to topichood (section 3.3.3). In section 3.3.4, unmarked topics are discussed. Finally the non-prototypical topics are analyzed (section 3.3.5).

In this section, we make a distinction between three types of markers: syntactic marking, non-manual markers, and prosodic boundaries. Theoretically speaking this division is controversial, especially with respect to the status of non-manuals. Some researchers argue that non-manuals fulfill a syntactic function (Neidle et al. 2000), while others have argued that non-manual markers are prosodic in nature (Sandler and Lillo-Martin 2006). Leaving the theoretical debate aside, we use these three categories descriptively. Syntactic marking in this chapter means manual marking only, that is word order, and some potential manual markers of topics. Non-manual marking includes eyebrow movements and head and body tilts. Prosodic boundaries can be realized as pauses or changes in non-manual behavior (see section 3.3.3 for a further discussion of the relation between non-manual markers and prosodic boundaries). The issue of the theoretical analysis of the different markers lies outside the scope of this dissertation.

The numerical results based on the analysis described in this section are summarized in table 3.3. In this table, aboutness and scene-setting topics are considered separately. As for aboutness topics, they are first divided into overt and null topics; the overt topics are further divided into marked and unmarked, and the marked topics are then further divided into marked non-manually and marked by prosodic boundaries only. In the case of scene-setting topics, non-manually marked topics are differentiated from those marked by prosodic

boundaries only. The table reports percentages in relation to the total number of sentences with potential topics, with absolute numbers in brackets.²⁶ This table does not reflect syntactic marking of topics, because, as we discuss in the next section, it is only directly visible in the case of topicalized objects or in combinations of aboutness and scene-setting topics, so no statistics can be reliably derived from the corpus.

Table 3.3 Prototypical topics in RSL and NGT

RSL				NGT			
Total number of sentences with potential topics = 1619				Total number of sentences with potential topics = 1481			
Aboutness topics							
Overt topics 35% (571)			Null topics 65% (1049)	Overt topics 38% (564)			Null topics 62% (917)
Marked 17% (279)		Un-marked 18% (285)		Marked 19% (287)		Un-marked 19% (284)	
Nonmanuals 3% (47)	Boundaries 14% (232)			Nonmanuals 6% (89)	Boundaries 13% (198)		
Scene-setting topics							
Nonmanuals 30	Boundaries 78			Nonmanuals 38	Boundaries 50		

Before we proceed to discuss the different markers of topics, we should note the fact that in the most common case, the topic is not overtly expressed; see (1) for examples. In particular, in NGT 62% of sentences do not have an overt topic (917 out of 1481 sentences), and in RSL 65% (1049 out of 1619 sentences). This means that zero expression is the most typical marker of topics in both languages. However, among the remaining 40% of sentences in both languages, several topic markers are used which will be analyzed in this section.

- (1) a. LOOK [RSL-cr1-10]
 ‘[The cat] looks.’
 b. CL:GO.DOWN [NGT-1712-71]
 ‘[The cat] goes down.’

3.3.1 Syntactic markers

RSL and NGT have a variety of manual syntactic strategies to mark topics, namely word order, topic copying, combination of an index sign with the topic, simultaneous marking of topic and comment, and one potential morphological topic marker (the Palms Up sign). These will be discussed in this order in the following sub-sections.

²⁶ For scene-setting topics only the number are reported, because it is not clear how to assess the number of sentence which would have potentially null scene-setting topics (probably every sentence can be analysed as such).

3.3.1.1 Word order

Both aboutness (2a) and scene-setting topics (2b) are placed clause-initially. Although there are very few examples of sentences containing both a marked scene-setting ('sst') and a marked aboutness topic ('top'), it is still possible to argue that in both sign languages, the general order in such cases is [Scene-Setting – Aboutness – The rest] as in (2c-d):

- (2) a. er+bht
IX CAT IX THINK [RSL-cr8-12]
'The cat thinks.'
- b. er
IX WALL WATER PIPE [RSL-cr6-12]
'There is a waterpipe on the wall.'
- c. bht
[THEN]_{sst} / [IX]_{top} / GO [NGT-1712-71]
'Then he goes away.'
- d. bht
[FOURTH]_{sst} / [IX CAT]_{top} / LOOK [RSL-cr8-19]
'In the fourth story the cat looks.'

Not unexpectedly, most of the non-manually marked aboutness topics are subjects, so it is difficult to show whether their clause-initial position is syntactically marked, given that in the unmarked word order subjects are preverbal both in RSL and in NGT (Kimmelman 2012a, Coerts 1994). However, there are several arguments in favor of the presence of syntactic marking as well. Firstly, non-subject topics (although scarce) are present both in RSL and NGT: for instance, in (3a) and (3b), the objects (first person pronoun in both cases) are marked as topics.

- (3) a. er
IX-1 / IX LOOK-1 [NGT-94-1]
'They look at me.'
- b. bht
IX-1 / SOMETHING STING BITE [RSL-s2-12]
'Something bit me.'

Secondly, sometimes aboutness topics precede marked or unmarked scene-setting topics, as in (4), where the aboutness topic CAT precedes a prosodically marked scene-setting topic NOW. Since previous research (Kimmelman 2012a) has shown that in RSL scene-setting topics (also unmarked) tend to precede the subjects, it is possible to argue that the sentence-initial position of aboutness topics in these cases is marked. Finally, in all the sentences that were analyzed as containing a marked aboutness topic, the topics were also marked prosodically: there was always a prosodic boundary between the topic and the rest of the sentence. Within a theoretical framework, this could be an argument in favor of syntactic processes that make the position of the topic marked (section 2.2).

- (4) CAT / NOW / CLOTHES HAT [NGT-211-12]
'Now the cat is wearing new clothes and a hat.'

It is also interesting to address the question as to whether topics are moved to a specific position or whether they are base-generated there (section 2.2). It appears that, based on the

analysis of the available data, it is not possible to answer this question conclusively. Aarons (1994) used ASL examples similar to (3a) and (3b) to argue that the topicalized object has in fact moved to the sentence-initial position because the sentence without the topic would be ungrammatical. This is related to the fact that plain verbs in ASL do not allow for object omission, so the sentence without the topic would be incomplete. However, there are no studies that have shown that the same restriction applies in NGT or RSL; note also that the verbs in (3a) and (3b) are agreeing, not plain, and the agreement might license object omission.

In addition, Aarons (1994) claimed that some of the topics in ASL are in fact base-generated. This is true in situations when the topic is not an argument of the predicate (Chinese-style topics, Sze 2008), so it cannot be generated within the clause. Such examples are almost non-existent in the corpora²⁷: one possible example is shown in (5a), where the topic is actually the possessor (IX-1) of the subject NP IX HUSBAND ‘the husband’ (however, this might also be an instance of false start). Finally, another phenomenon in ASL described by Aarons (1994:156) is the use of resumptive pronouns: if the sentence contains a pronoun that has the same referent as the topic, it is reasonable to suggest that the topic is base-generated and not moved. Such examples can be found in RSL and NGT: in (5b) and (5c), the pronominal topic IX-1 is also realized as a resumptive pronoun within the sentence.

- (5) a. er
[IX-1]_{top} IX HUSBAND CALM [RSL-s2-16]
‘As for me, [my] husband is calm.’
- b. bht
IX-1 / INSIDE IX-1 FUNNY LAUGH [RSL-s2-10]
‘I am laughing inside.’
- c. bht
IX-1 PU / IX-1 LOOK.AROUND [NGT-208-11]
‘I look around.’

However, this criterion is not conclusive, as according to some researchers, resumptive pronouns can appear in a sentence with a moved topic as well (for details, see É. Kiss 1995). Moreover, the absence of a resumptive pronoun does not exclude a base-generated topic. Van Gijn (2004) has claimed that topics in NGT (whether accompanied by a resumptive pronoun in the clause or not) do not show subjacency effects, so in a movement analysis, they would cross island boundaries. She suggests therefore that all topics in NGT are base-generated. Within the limits of the current study, it is not possible to pursue this question further.

3.3.1.2 Topic copying

NGT has another strategy of topic marking, namely topic-copying: a pronoun referring back to the sentence topic appears in the sentence final position (6). Many sign languages display similar phenomena which are often described in terms of “subject pronoun copy” (see Padden 1988 for ASL, and Bos 1995 for NGT). However, Crasborn et al. (2009) demonstrated that in NGT, the sentence-final pronoun does not have to refer back to the subject, but can refer to the topic instead, be it a subject or object, or a scene-setting topic. They coined the term “topic agreement”, but we use the term topic copying to avoid the discussion of the nature of agreement. The present study confirms the existence of this strategy for NGT based on the

²⁷ This is true only if scene-setting topics as Chinese-style topics are excluded. In any case, this is irrelevant to the question of base generation vs. movement of aboutness topics.

corpus data. In the small corpus of NGT analyzed here, too, clause-final pronouns can refer back to both aboutness and scene-setting topics. In RSL no such strategy could be attested (at least based on the corpus data available).

- (6) [IX-1]_{top} DARE [IX-1]_{top} [NGT-4-3]
 ‘I dare.’

Note that the clause-final pronoun in (6) is not a resumptive pronoun as, for instance, in (5). The post-verbal position of the clause-final pronoun is clearly different from the regular pre-verbal position of a subject pronoun.

In chapter 5, we will argue that topic copying in NGT is a manifestation of a general phenomenon of doubling and that the function of topic copying is pragmatic: it is used to foreground an important topic that will be reused in the subsequent discourse.

3.3.1.3 The IX + topic strategy

Both in RSL and NGT, some sentences contain a prosodically isolated sentence-initial pointing sign alongside the sentence-initial and non-manually marked aboutness topic. For instance, in (7) the topics PORTER and MONKEY are marked non-manually, while the preceding pointing sign IX is not marked.

- (7) a. $\frac{\text{er}}{\text{IX PORTER OF HIGH.BUILDING}}_{\text{top}}$ CL:TAKE $\frac{\text{Er}}{\text{CL:HOLD.TELEPHONE}}$
 ‘The porter of the high building takes a telephone.’ [NGT-212-11]
- b. $\frac{\text{er}}{\text{IX MONKEY}}_{\text{top}}$ NEED BANANA [RSL-cr4-10]
 ‘The monkey needs banana.’

It is not clear what the syntactic position of these pointing signs is. If they are indeed a part of the topic, as suggested by the bracketing in the examples, then with respect to word order, these examples do not require an explanation: they all contain clause-initial topics. Also, it is very common for indexes to form one prosodic word with another sign (Nespor and Sandler 1999). However, if these indexes are indeed syntactically and prosodically part of topical constituents, then it is strange that they are not marked non-manually.

On the other hand, if we consider the indexes to be topic-external, then the examples in (7) go against the general tendency to place marked topics clause-initially. For such an analysis, the function of the index signs would have to be clarified: if they do not belong to the topics, what do they point at? It appears that they are either used to establish a new locus for the topical noun or, more rarely, to re-activate this locus (and therefore re-activate the referent). Nouns in sign languages can be assigned loci in the signing space, but whether this happens or not depends on multiple factors, topichood being an important one (Barberà 2012). In most of the examples involving the IX + topic strategy, the topical referent has been mentioned before, either in the same story or in the previous ones, but the location for this referent has not been established. So when the signer uses the pointing, the pointing by itself is not informative, because the locus is not yet associated with the referent of the noun phrase.

It could be argued that only the index in these sentences is the topic, while the noun phrase following it is a clarification. In section 3.3.2 below, it is shown that eyebrow raise in RSL and NGT is sometimes used to mark the clarification, in other words, additional information that the signer provides when she feels that the addressee might need this

addition. Consequently, the structure of the examples in (7) above might actually be as shown in (8) below:

- (8) a.
$$\begin{array}{ccc} & \text{er} & \text{er} \\ \text{[IX]}_{\text{top}} & \text{[PORTER OF HIGH.BUILDING CL: TAKE]}_{\text{clar}} & \text{CL:HOLD.TELEPHONE} \\ \text{'The porter of the high building takes a telephone.'} & & \text{[NGT-212-11]} \end{array}$$
- b.
$$\begin{array}{ccc} & \text{er} & \\ \text{[IX]}_{\text{top}} & \text{[MONKEY]}_{\text{clar}} & \text{NEED BANANA} \\ \text{'The monkey needs the banana.'} & & \text{[RSL-cr4-10]} \end{array}$$

There are some questions arising from this analysis. For instance, it is not clear whether clarifications in RSL and NGT generally have to be marked by eyebrow raise. If this is the case, then some of the examples with a prosodically isolated clause-initial pointing could not be analyzed as containing clarifications, because not all of them feature the non-manual marking. However, for most of the examples, an analysis along these lines does resolve the problem of whether the pointing is topic-internal or topic external: the pointing signs are now the topics, while the following noun phrase is a clarification, which naturally constitutes a separate intonational phrase (Nespor and Sandler 1999). Due to the relatively small number of such examples (20 in RSL and 29 in NGT), it is difficult to further specify the function and formal properties of this strategy.

3.3.1.4 Simultaneous marking

RSL and NGT have a modality-specific strategy of expressing topic and comment simultaneously, either by articulating the topic on the one hand and the comment on the other, or by articulating the topic manually and the comment non-manually. For instance, in (9a) the topic IX is signed by the non-dominant hand, while the comment OFFENDED is articulated simultaneously by the other hand. Example (9b) illustrates the other strategy: the topic IX is expressed by the hands, while the comment 'nods' is the actual nodding the signer performs with his head.

- (9) a. [RSL-s1-20]



h1: OFFENDED
h2: IX-----
'He is offended.'

b.

[NGT-212-11]



Head: nods
 Hands: IX
 'He nods.'

In chapter 6, we will further discuss simultaneous constructions (weak hand holds) and argue that they are used to express IS as well. In particular, discourse topics (a notion different from both aboutness and scene-setting topics, see section 2.5) are sometimes marked by this type of construction (section 6.3).

3.3.1.5 PALMS-UP as a topic marker

Finally, in the corpus data one potential marker of topics has been found, namely the PALMS-UP (PU) sign. Many sign languages have PU, and it is one of the most frequent signs in NGT (Crasborn, p.c.). PU most likely originates from a gesture commonly used in the hearing culture, and what is very interesting about this sign is its multifunctionality (see McKee and Wallingford 2011, van Loon 2012). In NGT the sign is also multifunctional, as van Loon (2012) has shown, and expressing of modality and a question particle among other functions. For RSL no such studies have been conducted as yet, but the corpus data analyzed here gives the impression that PU in RSL has many of the same functions.

In the course of analyzing the corpora, it appeared that the PU sign sometimes appears immediately after a topic (10). However, this phenomenon is infrequent: there are only 5 cases of PU in NGT and 21 cases in RSL appearing after a topic. Also, this phenomenon is almost never observed in the Canary Row stories (only one case in RSL and one case in NGT), suggesting that this function of PU is more related to conversations than narratives.

- (10) a. IX-1 PU / SAY-1 [NGT-1776-74]
 'You called me.'
 Er
 b. WOMAN PU / FACE INDIFFERENT [RSL-s1-10]
 'The woman stands with an indifferent face.'

It does not seem plausible to claim that PU is a topic marker itself, parallel to morphological topic markers present in some languages of the world (Aboh and Essegbey 2010). Firstly, the most common situation in which PU appears is when the topic introduces role shift, as in (11) (but this is not always the case, as the examples in (10) show). It is therefore possible to say that the function of PU is to introduce the content of the role shift (usually this is the speech of the character mentioned). Moreover, most of the role shifts introduced by PU are questions, so it is possible to say that the function of PU here is a question particle (although PU as a

question particle is expected to appear in the clause-final position in NGT (van Loon 2012)). Finally, in some cases, it is possible to say that the function of PU is to express some modal meaning as in (11c), where the signer expresses concession. Note that in this example, PU also appears for the second time in the clause-final position which indicates that it has some function other than marking the topic.

- (11) a. IX-1 PU / IX HOW? [NGT-93-1]
 ‘I’m like: how can I do it?’
 b. IX-1 PU / HOW WAS HOW WAS?²⁸ [RSL-s1-12]
 ‘I’m like: what should I do?’
 c. er IX-1 PU / bht IX-1 LOVE PAINT PU [RSL-s3-18]
 ‘What can I say – I do love to paint.’

To sum up, PU is not used as a marker of topic. However, it occasionally appears in the position immediately following the topic, and, moreover, it usually forms one prosodic constituent with the topic, with a pause after the PU sign. It is reasonable to consider PU (in some usages) a topic-sensitive element, similar to certain IS-related elements attested in spoken languages. For instance, in most languages, focus particles like *only*, *also*, and even are focus-sensitive, as they are almost always in focus (Krifka 2008). In Russian there are two lexemes that can be translated as ‘now’: *sejčas* and *teper*; use of the former is not restricted but the latter can only appear in the topic of a sentence, therefore, it is a topic-sensitive element similar to PU in RSL and NGT, although PU is not restricted to topic-sensitive usages. A large-scale study on the functions of PU is required to shed more light on the relation between topics and PU.

3.3.2 Non-manual markers

Both in RSL and in NGT (see also Crasborn et al. 2009), topics can be marked by raised eyebrows and/or backward head tilt (and arguably sideward head tilts as well). Eyebrow movement will be discussed first (sections 3.3.2.1-2), followed by head tilts (section 3.3.2.3). However, before discussing these markers, a note on eye aperture is necessary.

In many sign languages, including NGT (Crasborn and van der Kooij 2013), eyebrow raise often co-occurs with a wide opening of the eyes. Crasborn and van der Kooij (2013) discuss the possibility that these two non-manual markers (as well as the backward head tilt) are manifestations of the same phonological feature. In contrast, some sign languages have been claimed to mark some topics with a narrow aperture of the eyes, that is, an eye squint (Dachkovsky and Sandler 2009). In section 3.3.2.1, we will briefly explore whether eye aperture plays a role in marking topics in RSL and NGT. However, a full analysis of this non-manual marker is beyond the scope of this chapter since annotating eye aperture manually takes too much time and is quite unreliable. In section 3.7, this aspect will be returned to in terms of further research directions.

3.3.2.1 Functions of eyebrow movement in RSL and NGT

Eyebrow raise is a very common marker of topics in many sign languages (section 2.2). However, it is also clear that eyebrow marking can serve various other functions: from

²⁸ HOW WAS is a borrowing of the Russian expression *kak byt* ‘what should (I) do’ (lit.: how to be).

depicting emotions to expressing grammatical relations. Therefore, in order to study eyebrow movement as a topic marker in the corpus data, it was necessary to first identify other possible functions of eyebrow movement and to distinguish these from topic marking.

In order to identify the functions of eyebrow movement, all eyebrow movements were recorded on a separate tier in ELAN. They were categorized as raised eyebrows or lowered eyebrows. In fact eyebrow raise can be combined with eyebrow lowering that is realized as the movement of eyebrows toward the bridge of the nose.

In the NGT corpus, 730 eyebrow movements were found, and 500 in the RSL corpus (see table 3.4). In both languages, eyebrow raise is more frequent than lowering, accounting for about 75% of all eyebrow movements.

Table 3.4. Eyebrow movements in RSL and NGT

	<i>Raised eyebrows</i>	<i>Lowered eyebrows</i>	<i>Mixed</i>	Total
NGT	510 (70%)	180 (25%)	40 (5%)	730
RSL	340 (68%)	120 (24%)	40 (8%)	500

Eyebrow movement is an extremely difficult phenomenon to analyze and classify because different factors can affect the movements. Most importantly, linguistic and emotional eyebrow movements interact in a complex way (Weast 2008, de Vos, van der Kooij and Crasborn 2009). However, it is possible to divide them into several categories in terms of function: non-linguistic or emotional movements, emphatic marking, lexical movements, grammatical markers including question markers, and movements used to mark IS notions. These functions will be briefly discussed in turn.

Non-linguistic functions

There are some non-linguistic functions of eyebrow movement. Eyebrow movement can be a (part of a) facial gesture, also present in the hearing culture. For instance, eyebrow raise accompanies the gesture of widening the eyes. Also, if the signer takes on the role of a character of the narrative, the eye gaze can be gestural. When the signer hesitates, eyebrows are often lowered (Prozorova 2009). The same is true for RSL and NGT. The fact that hesitation is marked with lowered eyebrows is also connected to the fact that the same movement is related to confusion. Eyebrow lowering is an inherent part of anger, confusion or disgust (Ekman and Friesen 1978), whereas eyebrow raise is an inherent part of surprise and fear,

Emphatic marking

In some cases, eyebrow movements can be attributed to emphasis, probably in relation to eyebrow movements in similar contexts in the hearing culture. Most of the times, emphatic items are accompanied by eyebrow raise (12a-b). However, when emphasis is negative (connected to negative emotion or negative evaluation of the situation), the eyebrows are lowered (12c), which might be specific to sign languages.

- (12) a. er
 REALLY LIVE NEED [RSL-s1-16]
 ‘I **really** need to live.’

- b. $\frac{\text{er}}{\text{DOG ALWAYS}} \quad \frac{\text{ef}}{\text{MUST IN.WATER.}}$ [NGT-4-3]
 ‘The dog always wanted to go into the water.’
- c. $\frac{\text{ef}}{\text{DRINK}} \quad \text{A.LOT WATER DRINK}$ [RSL-s2-12]
 ‘I drank a lot of water.’

Lexical functions

Eyebrow movement, just as other non-manuals (Pfau and Quer 2010), can also fulfill a lexical function, in other words, it can constitute a part of the phonology of a sign. Some lexical items in NGT, such as THEN and KNOW, are often accompanied by an eyebrow raise. This might be connected to their meaning. For instance, THEN almost always functions as a scene-setting topic (see section 3.3.2.2 for more detail).

In RSL a different kind of lexical eyebrow raise (and backward head tilt) is found, which accompanies verbs (typically verbs of motion); it is provisionally called *lexical echo movement* in this chapter. The movement in the verb is either a straight upward movement or an arc movement where the hand moves up during the first half of the sign ((13) and figure 3.1). The movement of the eyebrows mirrors the movement of the hands in the verb, so this phenomenon is similar to what Woll and Sieratzki (1998) referred to as “echo-phonology”.

- (13) $\frac{\text{er}}{\text{CL:CLIMB.UP}} \quad \text{WINDOW}$ [RSL-cr2-18]
 ‘He climbs up on the windowsill.’

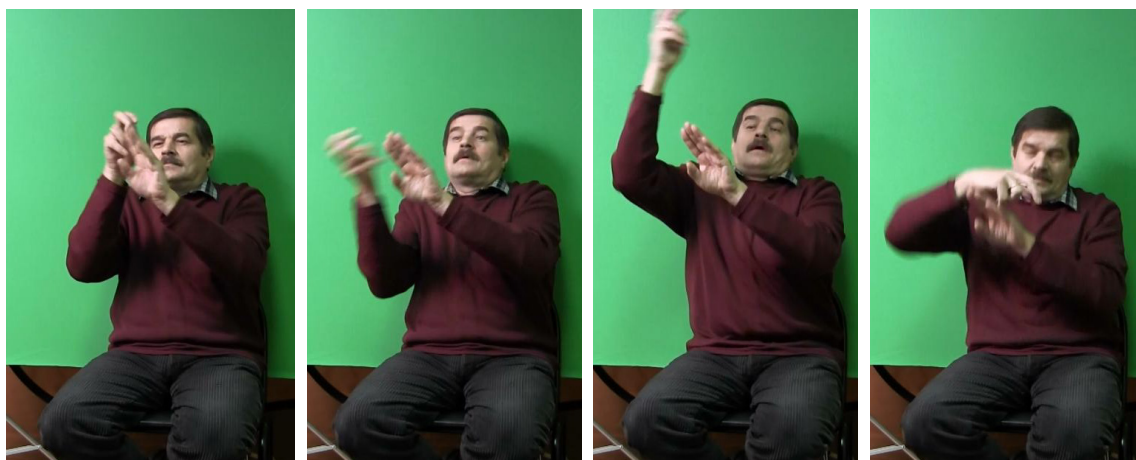


Figure 3.1. Captions of the verb CL:CLIMB.UP

It is important to emphasize that this type of eyebrow raise only accompanies verbs with a straight or arc-shaped movement, namely CL:CLIMB.UP, FALL.OUT, ENTER, CL:RUN.IN, CL:LIFT, CL:PUT, CL:THROW, CL:GRAB, CL:RAISE, ARRIVE, STOP in RSL. In NGT focus is sometimes marked by eyebrow movements (Crasborn and van der Kooij 2013), so examples like (13) might also be interpreted as instances of focus marking in RSL. However, if that would be the case, it should have been possible to find eyebrow movements accompanying focused verbs with different movement patterns, but this is not the case. This eyebrow movement might also be a focus marker that can only co-occur with a certain class of verbs. Irrespective of the analysis, there is a difference between NGT, where focus can generally be marked by

eyebrow movement, and RSL, where either eyebrow movement does not mark focus at all or only in a phonetically constrained set of situations.

Grammatical functions

Wh-questions (14a) and yes/no questions (14b) are regularly marked with eyebrow movements in both RSL and NGT, and in many other sign languages (Weast 2008).

- (14) a. er
CLUB HOUSE WHERE? [NGT-208-12]
'Where is the club?'
- b. er
IX-1 WE-TWO CHAT [NGT-170-10]
'Should we two chat?'

Negative expressions in both languages are marked by a complex of non-manual signals, the most important of them being headshake, lowered eyebrows, and pursed lips. Moreover, several types of subordinate clauses can be marked with raised eyebrows: relative clauses and causal subordinate clauses in RSL and NGT, temporal subordinate clauses in NGT, and conditionals in RSL.

IS markers

Eyebrow movements are used to mark various aspects of IS in the two languages, namely topic (discussed in detail in section 3.3.2.2), clarification, familiar information (known as the "you know" expression in the NGT literature), and focus.

Both NGT and RSL feature a special facial expression – wrinkled nose in combination with lowered eyebrows (figure 3.2) – which, based on the corpus data, appears to combine with nouns where the referent is known to the addressee but not active in the discourse (15). However, there were only few instances of this marker in the NGT and RSL data analyzed here.



Figure 3.2. 'You know' expression in RSL and NGT

- (15) a. ef
IX-1 WALK IX-1 HOUSE WALK GO CAR IX-1 WALK [NGT-170-10]
'I went from my house to the car.'
- b. ef
ANCIENT TELEPHONE CL:STAND [RSL-cr5-12]
'An ancient telephone stands.'

As has been mentioned previously, in both languages, eyebrow raise can mark additional information or clarification. Quite often the eyebrow raise accompanies a constituent placed between two instances of the doubled constituent to mark clarification (16), but doubling is not a necessary precondition of clarification (see also the discussion of clarification in section 3.3.1).

- (16) a. WINDOW er HIGH.BUILDING WINDOW K-A-N-A-R-Y CAGE CL:SIT
 ‘In the window of a high building a canary sits in a cage.’ [RSL-cr2-18]
- b. CL:LOOK.IN.BINOCULARS IX LOOK-1 er BIRD CL: LOOK.IN.BINOCULARS
 ‘The bird looks through the binoculars.’ [NGT-1712-71]

Crasborn and van der Kooij (2013) have found that information focus and contrastive focus in NGT can both be marked by eyebrow raise. Their finding is confirmed by the corpus data. In the corpus of NGT analyzed here, there were 14 sentences with the (part of) focus marked by eyebrow raise (17). This phenomenon is discussed further in section 4.5.

- (17) er
 [CAGE CL:CARRY]_{FOC} [NGT-2079-84]
 ‘He carries the cage.’

RSL does not mark focus by means of eyebrow movement. Occasionally, verbs which are focused are marked with raised eyebrows, but these are instances of echo eyebrow movement, as discussed above, and not of focus marking. Examples parallel to (17), where an object constituting a part of a focused constituent or the whole focused VP are accompanied with eyebrow movements were not found in the RSL corpus.

3.3.2.2 Eyebrow movement for topic marking

Having identified various functions of eyebrow movements, we can now zoom in on their use in topic constructions. In both RSL and NGT, topics of different types can be marked by eyebrow raise (and in some very rare cases by eyebrow furrowing). In the RSL data, 60 cases of potential non-manually marked topics have been found, and in the NGT data 98 cases. In RSL and NGT, both aboutness and scene-setting topics can be marked by eyebrow movement. Both kinds of topics are well-represented in both languages: in RSL 31 aboutness topics are marked in this way (11% of all marked aboutness topics), and in NGT 67 aboutness topics (23% of all marked topics). In addition, 25 (23% of all) scene-setting topics in RSL and 31 (35% of all) scene-setting topics in NGT are marked. For example, in (18a-b) the aboutness topics CAT and CANARY are marked by eyebrow raise, while in (18c-d) the scene-setting topics WALL and IX ‘there’ are marked.

- (18) a. er+bht
 IX CAT IX THINK [RSL-cr8-12]
 ‘The cat thinks.’
- b. IX er CANARY TURN [NGT-1773-73]
 ‘The canary turns.’

- c. er
IX WALL WATER PIPE [RSL-cr6-12]
'There is a waterpipe on the wall.'
- d. er
IX (WIRE) NOB NOB [NGT-27-3]
'There are nobs on the wire.'

The fact that in RSL and NGT both aboutness and scene-setting topics are marked, but not always in either case, is in contrast to HKSL, where only the scene-setting topics are consistently marked with eyebrow movements (Sze 2008). However, in both languages, scene-setting topics are more often marked with eyebrow raise than aboutness topics²⁹, so there is a trend for scene-setting topics to be more regularly marked in these languages as well.

In most cases, the eyebrow movement is neatly aligned with the topic, both in the cases of aboutness and scene-setting topics. There are some cases in both languages, however, in which the non-manual marking extends further to one or more signs following the topic. In (19a), the eyebrow raise spreads from the topic DOG to the adjacent sign ALWAYS, and in (19b) it spreads from the topic CAT to a part of the verb RUN.AWAY. It might be the case that the eyebrow raise has a different function on the adjacent signs and that the topical marking merges with the other marker without a clear boundary.

- (19) a. er ef
DOG ALWAYS MUST IN.WATER [NGT-4-3]
'The dog always wanted to go in the water.'
- b. er
CAT RUN.AWAY [RSL-cr2-10]
'The cat runs away.'

In both languages, there are also some cases in which the non-manual marking does not extend over the entire topic constituent (20). For instance, in (20a) only the quantifier is marked non-manually, but not the whole noun phrase ALL PEOPLE. In (20b) only the pointing sign is marked, which might be a manifestation of the 'IX + topic' strategy discussed in section 3.3.1.3, a notable difference being that the non-manual marking is reversed: in the examples in (8), it is the index that is unmarked while the adjacent noun is marked by eyebrow raise.

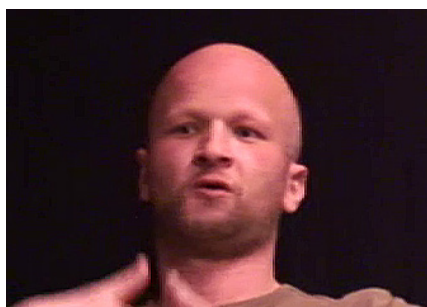
- (20) a. er
[ALL PEOPLE]_{top} LOOK [NGT-208-12]
'All people look.'
- b. er
[IX CAGE]_{top} YELLOW BIRD CAGE [NGT-1772-74]
'In the cage there is a yellow bird.'

Sometimes signs with lexical eyebrow movement (see section 3.3.2.1) serve as topics. For instance, the sign THEN in NGT is often accompanied by an eyebrow raise. As it sets the time parameter of the scene expressed by the sentence, it often functions as a scene-setting topic. It might thus be the case that THEN is often marked with raised eyebrows because it is topical.

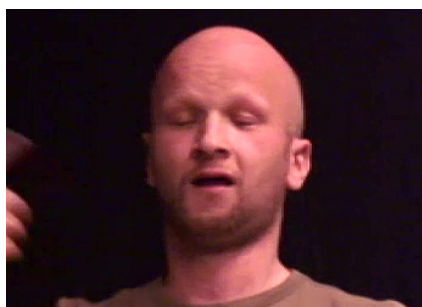
²⁹ For RSL: $\chi^2=6.6558$, $df=1$, $p=0.01$, Cramer's $V \approx 0.12$. For NGT the difference is almost significant: $\chi^2=2.9439$, $df=1$, $p=0.0862$, Cramer's $V \approx 0.08$.

However, in some cases, it is clear that the intensity of eyebrow raise on THEN is stronger than on the other lexical items in the topic, as shown for example (21) in figure 3.3. This example demonstrates that eyebrow raise is better analyzed as lexical marking on THEN, and that the lexical and the topic marking add up to yield a stronger marking.

- (21) $\frac{\text{bht+er}}{\text{TOMORROW MORNING}}$ $\frac{\text{er}}{\text{THEN}}$ $\frac{\text{ef}}{\text{SNOW SNOW(V)}}$ [NGT-208-12]
 ‘The following morning it snowed.’



a. marking on TOMORROW MORNING



b. marking on THEN

Figure 3.3. Different degrees of eyebrow raise in NGT

Since aboutness topics and scene-setting topics can both be marked with eyebrow movement, this suggests that they should both be seen as examples of a more general category of topics, despite the fact that aboutness topics are mostly old information, while scene-setting topics are mostly new information.

Finally, as discussed in this section and section 3.3.2.1, eyebrow raise in RSL and NGT is used to express a variety of meanings, ranging from emotional usages to grammatical functions, including questions (recall examples (14a-b)) and topics. This fact is probably not a coincidence but a result of diachronic development. On the basis of a study of ASL, Janzen (1999) concluded that the eyebrow raise marking topics is a result of grammaticalization. Eyebrow raise, he argued, has a gestural origin (it is used to mark the emotion of surprise), but has been grammaticalized to mark yes/no questions, subordination, and finally topics in ASL. This development is plausible given the functional relation of these grammatical categories and the original emotional use of eyebrow movement. He also posits that the topic can be interpreted as a question: for example, the topic construction “As for the cat, he looks at the canary” can be interpreted as “You know the cat? He looks at the canary”. Thus the marking of topics is the same as that used to mark question. Since eyebrow movements are used for the same set of functions, that is, emotional, grammatical and pragmatic, in RSL and NGT, it is plausible that a similar diachronic development has occurred in these languages (see also Pfau and Steinbach (2006)).

3.3.2.3 Head tilts as topic markers

Both scene-setting and aboutness topics are often marked by backward head tilts in RSL and NGT. In RSL there are 30 aboutness (11% of all marked aboutness topics) and 5 scene-setting topics (5% of all marked scene-setting topics) marked by backward head tilt, while in NGT there are 36 aboutness (12% of all marked aboutness topics) and 7 scene-setting topics (8% of all marked scene-setting topics) that are marked in this way. Note that a direct comparison of frequency of head tilts as topic markers is not possible due to different content of RSL and

found functional and phonetic differences. For instance, topics are more consistently marked by eye squint in ASL and by eyebrow raise in ASL, although both markers are used in both languages. In ISL squints have a more abstract function of topic marking, while eyebrow raise marks continuation. In ASL eyebrow raise marks topics, while squints mark low accessibility. In addition, eyebrow squints in the two languages, although perceptually similar, are realized by different facial movements.³⁰

Although the non-manual markers accompanying topics are very similar in RSL and NGT, there seems to be a phonetic difference between the languages. In RSL some of the eyebrow raise movements are relatively small (see figure 3.5). The analysis of corpus data alone does not allow for a detailed comparison between the functions and formal properties of non-manuals in RSL and NGT. A methodology like the one used in Dachkovsky et al. (2013), involving parallel sets of sentences from both languages, should be applied. A more detailed description and possible explanations of the differences between RSL and NGT therefore await further research. This issue will also be discussed in chapter 7.

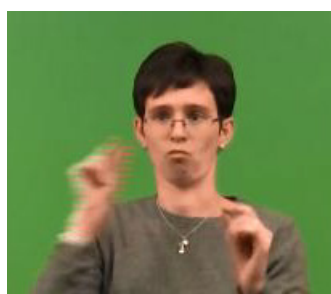


Figure 3.5. Small eyebrow raise on a topic in RSL

3.3.3 Prosodic boundaries

Non-manual marking is a type of prosodic marking available in sign languages (Nespor and Sandler 1999). However, there are also other potential prosodic markings, including manual pauses. Having identified the non-manual markers for topics (section 3.3.2), it is important to understand whether there are other prosodic markers of topics; in other words, whether there are topics which are marked by prosodic means other than non-manual markers. Prosodic boundaries in general and their relation to non-manual marking will be discussed first (section 3.3.3.1). Second, in order to determine the status of prosodic boundaries as topic markers, it is necessary to consider the relation between prosodic boundaries and role shift, since role shift automatically creates a prosodic boundary between the potential topic and the rest of the sentence (section 3.3.3.2). Finally, prosodic boundaries in sentences without role shift are analyzed with respect to their function as topic markers (section 3.3.3.3).

3.3.3.1 Prosodic boundaries and non-manuals

In most sign languages (see Sze 2011 for an overview), topics (whether they are marked non-manually or not) are usually separated from the rest of the sentence by a prosodic boundary. One way in which a prosodic boundary can be realized in a sign language is by means of a pause, which in the case of sign languages usually means a manual hold at the end of the last sign in the topic part of the sentence. Another way for a prosodic boundary to

³⁰ In particular, squints in ISL involve lid tightening and nasolabial fold deepening, while squints in ASL involve cheek raise and upper lip raise.

surface is when there is a change in non-manuals (Nespor and Sandler 1999). This means that if a topic is marked by, for instance, eyebrow raise, while the rest of the sentence is not, there is automatically a prosodic boundary after the topic. The remaining question is whether topics can be marked by a prosodic boundary in the absence of non-manual marking on the topic.

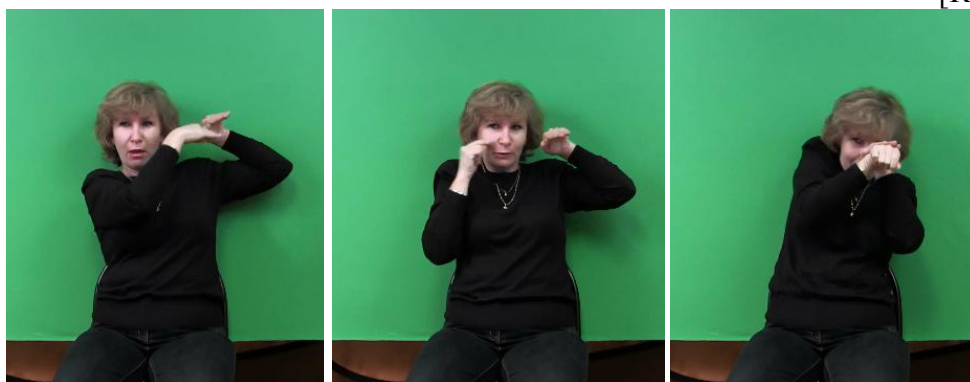
It has been claimed that topics can indeed be characterized by the absence of non-manual marking in Indo-Pakistani Sign Language (Zeshan 2004). The rest of the sentence might then be marked by some non-manual marker, for instance a question marker, while the topic remains outside the scope of this marking. This, however, has not been observed in all sign languages. For instance, in ASL, topics within yes-no questions are marked with raised eyebrows as usual, but the marking on topics is stronger than the marking on the rest of the sentence (Weast 2008).

The question of whether topics in RSL and NGT can be marked prosodically but at the same time remain non-manually unmarked is not easy to answer. Since one of the indications of a prosodic boundary is a change in non-manual marking, many examples of prosodically marked potential topics can be found, but this prosodic marking might be the result of other factors, most importantly, of role shift.

3.3.3.2 Role shift and prosodic boundaries

Role shift by definition involves a major change in body position and non-manual activity, as the signer takes on the role of one of the characters. Therefore, a prosodic boundary after a noun phrase in a sentence with role shift does not necessarily signal the presence of a marked topic, as illustrated in (23). In this example, there is a scene-setting topic separated by a pause from the following constituent, but there is also a prosodic break after the subject CAT, because there is a body lean on the verb CLIMB. However, the context suggests that the sentence is *thetic* (“A cat climbs in the shelves behind”), not *categorical* (“The cat climbs in the shelves behind”), so CAT is not the topic. The prosodic break following CAT is due to role shift, as the signer embodies the cat performing the action.

(23) [RSL-cr5-12]



IX-a SHELF / CAT / lb
 ‘A cat climbs in the shelves behind [him].’ [IX-b CL:CLIMB]_{RoleShift}

However, in sentences with role shift, marked topics are possible as well. For instance, a topic can be marked with eyebrow raise and/or head tilt (24). This means that if a sentence with role shift contains a noun phrase that is *not marked* by non-manuals, the sentence is ambiguous between containing a topic and being *thetic* (see also sections 2.2 and 3.4).

(24)

[NGT-209-12]



er
IX

‘He rubs his hands.’



dht
[RUB.HANDS]RoleShift

Still, one cannot conclude that a noun in a sentence parallel to (23) is not marked as a topic. Complications arise because in some cases, the subject introducing the character whose role the signer takes on can be non-manually marked as already belonging to the role shift. In (25) the downward eye gaze and confused expression constituting role shift are present on the potential topic OLD WOMAN.

(25)

[NGT-1775-73]



[OLD WOMAN
‘The old woman looks.’



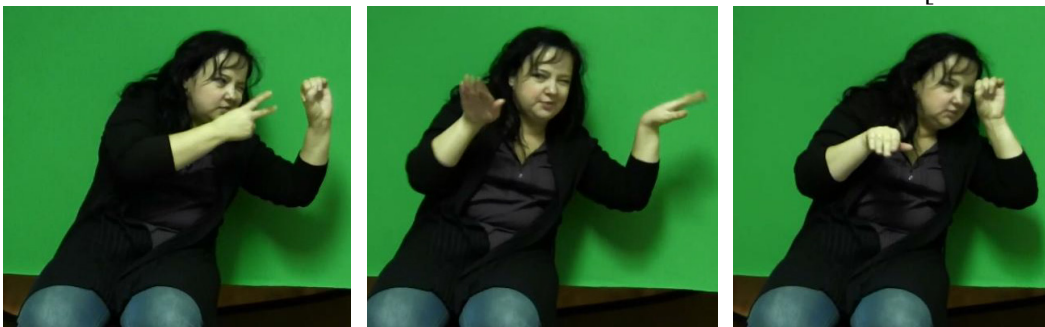
LOOK]RoleShift

Examples like this raise the question as to what governs the choice of markers on the potential topics in sentences including role shift. It is clear that if a potential topic is accompanied by eyebrow raise, it is a marked topic. It is also clear that if a potential topic is within the scope of the role-shift non-manual, it is not marked as a topic. But what about the third case as in (26-3)? What makes the potential topic escape the scope of role shift non-manual marking in (23)? This might be yet another kind of topic marking by non-marking, but examples like (23) go against this conclusion.

(26) *Possible scenarios of topic marking and role shift and their functions:*

1. [Top]EyebrowRaise [Comm]RoleShift – a marked topic (as in (24))
2. [Top Comm]RoleShift – an unmarked topic orthetic (as in (25))
3. Top [Comm]RoleShift – ??? (as in (23))

There is another argument against considering non-spreading of the role shift to potential topics as topic marking. Quite often other clearly non-topical noun phrases within the role shift can also be non-marked. In (27) the focal object BIRD is excluded from the role shift which is present on the verbs before and after it. The signer turns her head and looks at the addressee thereby temporarily going out of the role shift.³¹ It appears therefore that role shift does not have to spread from the predicate and that noun phrases often remain unmarked within the role shift.

- (27) [RSL-cr7-20]
- 
- [CL:LOOK.IN.TELESCOPE+SEE]_{RoleShift}
BIRD
[CL:LOOK.IN.TELESCOPE]_{RoleShift}
- ‘He sees the bird through the telescope.’

To sum up, examples with role shift are not helpful in finding out whether prosodic marking without non-manuals can serve as a marker of topics. Therefore, in the following section, only examples without role shift will be examined.

3.3.3.3 Prosodic boundaries without role shift

Considering only the examples without role shift (a small minority of examples in the corpora analyzed here), it becomes clear that topics indeed can be marked by prosodic boundaries (mainly by a pause).

- (28) a. IX-1 LOOK. LAUGH. **IX-1** _____er PU CAN.NOT IX-1 EXPLAIN. [RSL-s2-20]
 ‘I look. I laugh. I cannot explain it.’
- b. IX-a CAT THINK. (...) IDEA. **IX-a** [pause]/ RAIN.PIPE CL:CLIMB.IN [NGT-210-11]
 ‘The cat thinks. He’s got an idea. He climbs in a rain pipe.’

In both examples in (28), the topics of the last sentences (IX-1 and IX-a, respectively) are not marked by non-manuals; the sentences do not contain role shift, but there is a prosodic boundary following the topic. In (28a) the prosodic boundary occurs because the topic, in contrast to the rest of the sentence, is not marked non-manually.³² In (28b) the topic is followed by a pause.

It is also worth noting that many of the topics marked by prosodic boundaries only, that is, without non-manual marking, can be analyzed as base-generated topics. This is demonstrated by the presence of resumptive pronouns within the comment (29). However, base-generated

³¹ Note, however, that the body tilt is present on the bird as well, which might mean that role shift can be decomposed into several markers, some of them present throughout the whole sentence.

³² Note also that the prosodic boundary signals that PU is not a part of the topic (see section 3.3.1.5).

topics are not identical to prosodically marked topics, because we also find some base-generated topics that are marked with raised eyebrows and/or head tilt.

- (29) IX-1 dm / IX-1 INEXPERIENCED^{bht} [RSL-s1-16]
 ‘I myself was inexperienced.’

Scene-setting topics can also be marked prosodically without being marked non-manually. In (30) the scene-setting topic IX ‘there’ is not marked non-manually, while the rest of the sentence is. It is therefore prosodically separated from the rest of the sentence. It is not clear what determines the choice of the marker in the case of scene-setting topics.

- (30) IX / SAME CL:TRAM.GO^{er+bht} [RSL-cr8-20]
 ‘Back there goes the same tram.’

To sum up, topics in RSL and NGT can be marked by prosodic boundaries. In addition, they can be marked by eyebrow raise and/or head tilt.

3.3.4 Optionality of aboutness topic marking

After having established all the devices to mark topics, it is possible to provide an overview of how many of the overtly expressed topics are marked in RSL and NGT (table 3.5).

Table 3.5. Marked and unmarked aboutness topics

	Marked		Unmarked	Total
	<i>Non-manually</i>	<i>Boundaries</i>		
RSL	47 (8%)	232 (41%)	285 (51%)	564
NGT	89 (15%)	198 (35%)	284 (50%)	571

Interestingly, the two languages behave strikingly similar: in both, approximately half of the overt aboutness topics are marked, while the other half remains unmarked. Note that in the case of topic marked by boundaries, sentences with role shift were also counted as we were not able to decide that they do not include marked topics. Therefore, we can conclude that although topic marking is quite common, it is definitely not obligatory.

Consider example (31). The aboutness topic IX-1 is not marked by a non-manual marker and is not separated from the rest of the sentence by a prosodic boundary. It is placed in the sentence-initial position, but so would be a non-topical subject. Therefore, there are no overt markers of topichood associated with this noun phrase. Still, according to the functional definition adopted here, this noun phrase is the aboutness topic of this sentence.

- (31) [IX-1]_{top} BIRD IX WANT [RSL-cr1-10]
 ‘I want the bird.’

It is now possible to make a quantitative comparison between RSL and NGT. First, if we look at the general proportions of marked and unmarked aboutness topics in RSL and NGT, there are virtually no differences (table 3.5). On the other hand, the percentage of non-manually marked topics out of all marked topics is different in RSL and NGT: 35% in RSL vs. 54% in

NGT. The difference is statistically significant ($\chi^2=14.7827$, $df=1$, $p < 0.001$, Cramer's $V=0.17$, so the effect size is relatively small).

However, it is not appropriate to compare pure numbers of marked topics in the corpora, because the personal stories are not comparable with respect to their content. A valid comparison can only be made on the basis of the Canary Row stories. Focusing on these stories, RSL has 31 aboutness topics that are marked by eyebrow movement and/or head tilt out of 90 sentences with marked topics (34%), while NGT has 67 marked topics out of 157 such sentences (42%). The Pearson's chi-squared test shows that the difference is not significant ($\chi^2=0.5159$, $df=1$, $p=0.5$). Therefore, at this stage, we cannot find reliable differences in the frequency of non-manual marking of topics in RSL vs. NGT.

One of the most interesting questions that could be asked is why some topics are marked non-manually, while others are not. Although a full answer to this question is impossible at this point, at least one factor definitely plays a role in deciding whether an aboutness topic will be marked or not, namely topic shift. This will be discussed in section 3.4.4.

3.3.5 Non-prototypical topics

The previous analysis has been based on prototypical topics only, that is, as for aboutness topics, only topics that are old information have been considered. With the syntactic and prosodic markers of topics at hand, it is now possible to address the issue of the definition of topics again. In section 3.2.3, we have seen that there are different views regarding the question whether topics can be new information, and in section 3.1, the question of whether scene-setting topics and aboutness topics form one category has been raised. It is possible to identify the non-prototypical topics not complying with the definition in 3.2.3 and to scrutinize whether they are marked in the same way as prototypical topics.

In the RSL and NGT corpora, some marked topics appear to be new information. However, a more detailed analysis shows that the evidence is not conclusive. If we look at all cases where a potential topic is information which has never been mentioned during the elicitation session, then this potential topic is never marked by eyebrow raise or head tilt.

However, some new referents appear to be topics that are marked only by prosodic boundaries without non-manual marking in both sign languages, namely by a long pause and sometimes a head nod between the topic and the comment (32). Prozorova (2009) has found this strategy in RSL and analyzed it not in terms of topic marking, but in terms of discourse units (Chafe 1994). She claimed that RSL has the strategy of introducing new referents important for the further story as separate prosodic units, or utterances. In other words, the noun phrase IX CAT in example (32) can be analyzed not as a topic, but as a separate utterance introducing the referent. Further research should show whether this approach has its advantages, but for the moment it is also possible to say that new topics can exist in RSL and NGT, but they are only marked by pauses and never non-manually.

- nod
- (32) IX CAT [pause] / WINDOW IX HOUSE [NGT-2074-84]
 'A cat is in the window of a house.' or 'There was a cat. He was in the window...'

Nevertheless, it is not true that all topics that are marked non-manually are old information. There is a group of cases where it is actually not clear whether the referent is new or old, and the topics are still marked. Recall that in the cartoon task, the signers had to watch four short cartoons, and in all cartoons, the main characters were the same: the cat, the canary, and (in some of them) the granny. Hence, if in re-telling of the second cartoon the signer mentions the

cat or the canary for the first time, it is not clear whether the referent is new or old (or somewhere in-between). Exactly in such situations, the cat or the canary can be the marked aboutness topic (33).

- (33) $\frac{\text{er}}{\text{IX CAT IX THINK}}$ [RSL-cr8-12]
 ‘The cat thinks.’

Depending on the definition of old and new information, this can be an argument in favor of the existence of new topics. In addition, the fact that topics that are unambiguously new information (when the character has been mentioned for the very first time) are not marked non-manually in the analyzed corpora of RSL and NGT does not exclude the possibility that such new topics can be marked. The corpora are rather small, and therefore this possibility cannot be ruled out. To sum up, the RSL and NGT data so far are compatible with the existence of new topics, but do not provide clear evidence for them.

Another important question concerns the types of constituents that can be aboutness topics. It is clear that across languages, subjects are the most common topics. This fact is confirmed by the RSL and NGT data: a majority of topics are also subjects. However, there are some examples of objects marked as topics (syntactically and non-manually). This fact is important because otherwise, it would be impossible to claim that topic marking is present in these languages. In section 3.6, other potentially marked topics are discussed, namely VP-topics and clause-topics (clefts).

Finally, RSL and NGT data confirms what Sze (2008) has shown based on HKSL: aboutness and scene-setting topics are marked by the same formal means. Despite the difference in meaning (aboutness topics are mostly old information, while scene-setting topics are mostly new information), it is thus possible to conclude that there is a broad category of topics, which includes aboutness and scene-setting topics in these two languages.

Having established the multiple syntactic, non-manual, and boundary markers of topics, we now turn to the question what motivates the presence of non-manual topic marking. In the following section, one of the main factors influencing the type of marking is introduced, namely topic shift.

3.4. Topic shift

At the beginning of section 3.3, we saw that most commonly topics have zero expression, that is, they are not overtly expressed. Furthermore, we saw that when topics are overt, there is still a choice between using a non-manual marker of topics, inserting a prosodic boundary after the topic, or not marking the topic in any way. What factors determine the type of topic marking?

Previous research on spoken languages (Brunetti 2009) has shown that topic shift, that is, a change in topics between the sentences, can influence topic marking. In particular, in sentences with topic shift, topics are expected to be more marked. This manifests itself in the fact that shifted topics are more often overt, while non-shifted topics often have zero expression; furthermore, shifted topics are likely to be more marked syntactically and intonationally. In this section, the role of topic shift in relation to topic marking in RSL and NGT will be explored. In section 3.4.1, topic shift is defined for RSL and NGT; in sections 3.4.2-4, we explore the relation between topic shift and overtness of topics, while in section 3.4.5, we also analyze the relation between topic shift and non-manual marking.

3.4.1 Definition and challenges

Topic shift in spoken and sign languages is a relatively simple notion: a topic shift is said to have occurred if the topic of the sentence in question is different from the topic of the previous sentence (De Swart and de Hoop 2000, Brunetti 2009). This of course is only pertinent to aboutness topics. For instance, in the sequence “So, I want to tell you about Bob. Yesterday he saw Bill. He was furious”, there are two possible interpretations of the pronoun in the third sentence: *he* can refer either to Bob or to Bill. Depending on the interpretation, there is either no topic shift because the topic of both the second and the third sentence is Bob, or topic shift has occurred. The most general generalization is the following: if we have a sequence of two sentences $[S_1 S_2]$, and they have the same topic, there is no topic shift in S_2 . Conversely, if the two sentences have different topics, then there is topic shift in S_2 . If S_2 has no topic (if it isthetic), then topic shift is undefined.

In the procedure used to identify topic shift in RSL and NGT, some exceptions to this generalization were made. Firstly, if S_1 is a presentational sentence introducing the referent that would serve as topic in S_2 , this has been marked as no topic shift, despite the fact that S_1 and S_2 appear to have different topics (as, for example, in the sequence “Once upon a time there was a boy. He was very small.”). This decision has been taken because there is no real topic change between the two sentences, the first one having no aboutness topic, and also because a referent introduced in a presentational sentence in a sense has the highest topical status. Some theories (Smit 2010) even analyze the referent introduced by presentational sentences as being at the same time topical and focal.

Secondly, sometimes the identification of topic shift is complicated by the presence of role shift. Occasionally, there is a sequence $[S_1 \dots S_n]$, where sentence S_1 introduces a role shift, so that the sentences which follow $[S_2 \dots S_{n-1}]$ are all inside the role shift (34). Despite the fact that these sentences can have different topics, it is plausible to assume that there is no topic shift occurring in the last sentence (GO) because role shift is a way of maintaining an active topic, in this case, the noun phrase IX BIRD.

- (34) IX BIRD [WALK. HOW BE HOW BE. GO]_{RoleShift} [RSL-cr1-10]
 ‘The bird walks. What should I do [lit: how to be]? She walks.’

Thirdly, sometimes the topical sign is preserved across several sentences. To depict this situation, we need to use two tiers: one for each hand, as illustrated in (35). The topic of S_1 is held on the weak hand (h2) while the strong hand (h1) signs sentences $S_2, S_3, \dots, S_{n-1}$, but in sentence S_n , the topic is the same as in S_1 . We say then that there is no topic shift in S_n , although the topic in S_{n-1} may be different, because holding (part of) a sign on the weak hand is an obvious way of topic preservation. Therefore, when this topic is re-used, there is no reason to say that the topic has been changed.

- (35) h1: $[S_1][S_2][S_3] \dots [S_{n-1}][S_n]$
 h2: Top- S_1 -----

This phenomenon is illustrated by the RSL example in (36). In (36) there is no topic shift in the last sentence ‘She lowers binoculars’, because the weak hand hold spreads from the first sentence to the last thereby preserving the topic. For a detailed discussion of weak hand holds in relation to IS, see chapter 6.

(36)

[RSL-cr1-10]



H1: CL:LOOK.IN.BINOCULARS. IX APPEAR CAT. CL:LOWER.BINOCULARS

H2: CL:LOOK.IN.BINOCULARS-----

‘[The canary] looks through binoculars. There appears a cat. She lowers the binoculars.’

Finally, if sentences S_1 and S_2 were separated by a metalinguistic comment, such as “Yes”, “Right”, and so on, this metalinguistic comment was ignored for the purposes of determining topic shift; that is, the presence of topic shift in S_2 was determined by comparing the topic of S_2 to the topic of S_1 , without any reference to the intervening comment.

3.4.2 Topic shift in RSL and NGT

All sentences in the RSL and NGT corpora have been marked with respect to whether they contained a topic shift. The hypothesis tested is that topic shift correlates with overtness of expression of topics (Prozorova 2009, see also the accessibility hierarchy by Ariel (1990)). There are basically three degrees of overtness of topics: full noun phrases > pronouns > zero expression (topic omission). The expectation was that sentences with topic shift would have overt topics, while sentences without topic shift would contain covert topics. That is, in sentences with topic shift, full noun phrases and pronouns should be the most common ways of expressing topics, while in sentences without topic shift, zero expression would be the most common strategy. However, the results turned out not to be that straightforward.

Table 3.6. Overtness of topics with topic shift in NGT

Expression	Stories	%	Cartoons	%	St+Cr	%
<i>Pronoun</i>	137	46	47	16	184	31
<i>Full NP</i>	75	25	143	48	218	36
<i>Zero</i>	87	29	108	36	195	33
Total	299		298		597	

Table 3.7. Overttness of topics without topic shift in NGT

Expression	Stories	%	Cartoons	%	St+Cr	%
<i>Zero</i>	243	69	479	90	722	82
<i>Pronoun</i>	106	30	37	7	143	16
<i>Full NP</i>	2	1	17	3	19	2
Total	351		533		884	

Table 3.8. Overttness of topics with topic shift in RSL

Expression	Stories	%	Cartoons	%	St+Cr	%
<i>Pronoun</i>	185	38	28	13	213	30
<i>Full NP</i>	153	32	91	41	244	35
<i>Zero</i>	142	30	100	46	243	35
	480		219		699	

Table 3.9. Overttness of topics without topic shift in RSL

Expression	Stories	%	Cartoons	%	St+Cr	%
<i>Zero</i>	377	81	429	94	806	88
<i>Pronoun</i>	81	18	14	3	95	10
<i>Full NP</i>	5	1	14	3	19	2
	463		457		920	

Tables 3.6 and 3.7 above present the distribution of the degree of overttness of topic expressions with and without topic shift in NGT, separately for cartoons and for personal stories, as well as combined for both text types ('St+Cr'). The separation is necessary because, as will be demonstrated, there are some differences between the two genres with respect to topic shift. Tables 3.8 and 3.9 provide the same information for RSL.

There are several observations that can be made based on these tables. Firstly, if we look at sentences with topic shift (tables 3.6 and 3.8), there are no differences between RSL and NGT when it comes to the distribution of overttness of topics in general (Pearson's chi-square test, $\chi^2=0.6664$, $df=2$, $p=0.7166$). However, a comparison of tables 3.7 and 3.9 reveals a significant difference between the two sign languages in sentences without topic shift (Pearson's chi-square test, $\chi^2=13.5855$, $df=2$, $p < 0.002$, Cramer-s $V=0.087$, so the effect size is small): in RSL pronouns are rarer in this condition than in NGT, while zero marking is more common in RSL than in NGT. However, if we look more closely, it turns out that the difference is due to different patterns in the personal stories (while the cartoons again show similar distributions in the two languages). Since the themes discussed in the personal stories were not constrained in any way, the stories are not directly comparable, and it is therefore impossible to pin down the factors responsible for this difference.

Secondly, we can see that the overall tendencies are as expected: in the sentences with topic shift, overt topics (both full NPs and pronouns) constitute the majority (60-70%), while in the sentences without topic shift, zero topics are the most common strategy (more than 80%). Thirdly, and unexpectedly, we can observe that there is still a considerable number of sentences with topic shift that contain zero topics. Finally, there is a difference between the two kinds of tasks: in stories, non-zero expression of topics in sentences without topic shift is

much more common than in cartoons, and moreover, in cartoons, pronouns are used less often in sentences with topic shift than in stories.

3.4.3 Topic shift with zero expression

The general relation between the overtness of topics and topic shift is in agreement with our expectations. On the one hand, if there is no topic shift, there is no need to sign the topic again in each new sentence, and hence the zero expression is most common. On the other hand, with topic shift, zero expression can be misleading because the topic change is not indicated, so non-zero expressions are preferred. However, as we have seen, in the sentences with topic shift, zero expression of topic is still rather common (33% in NGT, 35% in RSL). It is possible to explain this surprising pattern if we look more closely at the properties of sign languages.

If we hypothesize that what drives the overtness of topic expression with topic shift is the necessity to provide the addressee with enough information, then it becomes clear that there are other devices available in sign languages that can fulfill this function apart from pronouns and full noun phrases. For instance, if role shift is involved, then one of the referents is always identifiable because it is represented by the body of the signer, and it is thus unnecessary to refer to it with a pronoun or a noun phrase. Within a role shift, there is no need for the signer to point to or name the referent represented by the signer's body, so even if the topic of sentence S_2 is different from the topic of sentence S_1 , it is possible to identify the topic of S_2 without any other means. For instance, in (37) the topic of the second sentence is the non-expressed noun phrase CAT, and despite the presence of topic shift between the two sentences, the cat is identifiable as the topic, because the signer takes the role of the cat holding the cup.

- (37) [CL:THROW.COIN]_{RoleShift-Granny} [CL:HOLD.CUP]_{RoleShift-Cat} [NGT-1715-72]
 'The granny throws the coin. The cat holds the cup.'

Furthermore, if a sentence contains an agreeing verb, then again the (shifted) topic can be identified without nominal expressions. For instance, in (38a) the verb LOOK-REC is an agreeing verb carrying reciprocal marking, which makes clear that its subject are the cat and the canary (which has been mentioned in the context preceding (39a)). The same is true if a classifier construction is used (38b), where the morphological properties of the classifier CL:WALK 'canary walks' allows identifying the canary as the topic. In classifier constructions, the handshape represents at least one of the arguments of the predicate (while the movement expresses the meaning of the predicate itself), and consequently, an overt nominal expression is not necessary, because no ambiguity arises. One should note, however, that in both cases, the use of an overt nominal expression would still be possible.

- (38) a. IX CAT LOOK. LOOK-REC [NGT-1712-71]
 'The cat looks. They look at each other.'
 b. CAT CL:CLAMBER. CL:WALK [NGT-21-4]
 'The cat clambers up. The canary walks from side to side.'

3.4.4 Differences between cartoon retellings and personal stories

Tables 3.6 to 3.9 reveal that there are clear differences between the two genres in terms of the forms used. In both sign languages, pronouns are used much more commonly in stories than

in cartoons both in sentences with and without topic shifts (for both languages according to Pearson's chi-squared test $p < 0.001$). One possible explanation for sentences with non-shifted topics could be that personal stories in general are longer, that is, they contain longer stretches of discourse within which the topic may remain the same but still should be re-activated from time to time by means of pronominal expressions. It is reasonable to assume that the overtness of a referent correlates with the degree of accessibility of the referent. Therefore, in longer stretches of discourse even non-shifted topics have to be overt at some point (Ariel 1990, Prozorova 2009). As for sentences with shifted topics, pronouns are also frequently used if there are longer stretches of discourse containing many sentences with topic shift but few (usually, two) easily identifiable possible topical referents (for instance: "The boy sees the girl. And she sees him. He runs towards her. She is afraid. He is almost there..."). Cartoons are shorter than personal stories and therefore contain less such stretches of discourse, which explains why full NPs are used relatively more often.

To sum up, topic shift is an important predictor of the overtness of aboutness topics in RSL and NGT. There are some deviations from the general tendency for shifted topics to be overt and non-shifted topics to be covert, but they can be explained by the grammatical properties of sign languages that help the addressee to identify referents in the absence of nominal marking. In the following section, we will see that topic shift also plays an important role in determining whether topics are non-manually marked.

3.4.5 Topic shift and non-manual marking

If we look at aboutness topics that are marked with eyebrow raise and/or head tilt, it becomes clear that topic shift is one of the factors that motivates non-manual marking. All aboutness topics that are marked with eyebrow movement surface in topic shift contexts. In the case of scene-setting topics, it doesn't make sense to speak of topic shift, so the reasons why only some scene-setting topics are marked are not clear.

There are a couple of possible counterexamples in which a marked topic appears not to be shifted. For instance, in the RSL example (39a), the marked topic INTERPRETER is the same as the topic in the previous sentence. However, the sentence also contains the intensifier SELF which means that the topic is probably emphatic or contrastive, and this may have caused the non-manual marking by itself. In one example in NGT (39b), the marked topic CAT is the same as the topic in the previous sentence. However, the sentence is actually the repetition of the previous sentence, and the two sentences should therefore not be considered a sequence with a topic not changing between them. The topic in the sentence preceding these two sentences is different.

- (39) a. $\overline{\text{er}}$
 INTERPRETER SELF YOUNG [RSL-s1-16]
 'The interpreter herself is young.'
- b. $\overline{\text{er}}$
 CAT GO. CAT GO [NGT-2077-83]
 'The cat goes.'

Thus, the exceptional cases in (39), in which a non-shifted topic is accompanied by eyebrow raise, can be explained in terms of emphasis or repetition. However, it is also not true that all shifted topics or all scene-setting topics are marked with eyebrow movements. For both kinds of topics, it is easy to find numerous examples which lack eyebrow movement: in (40a-b) the shifted aboutness topics are unmarked, and in (40c) the potential scene-setting topic is not marked.

- (40) a. WOOD A.LOT WOOD. IX-1 SIGN [NGT-92-2]
 ‘There was a wood with a lot of trees. I signed.’
 b. IX-1 UNDRRESS [RSL-s1-16]
 ‘I undress.’
 c. A.BIT.LATER TEETH OFF [NGT-94-1]
 ‘A bit later my teeth fell off.’

Moreover, as shown in section 3.4.2, topic shift does not even require the topic to be overt in all cases, let alone require the topic to be marked. Therefore, we can conclude that eyebrow movement occurs only on shifted aboutness and scene-setting topics, but is not obligatory in these situations. This fact is not trivial. Non-shifted topics can sometimes be expressed by full noun phrases or pronouns, but even in this case, they are never marked with eyebrow movements.

If we look at topics that are not marked non-manually but are separated by a prosodic boundary from the rest of the sentence, it is clear that they show properties different from the non-manually marked topics. It appears that not all of the former are shifted topics, as was shown in (28), repeated here as (41).

- (41) a. IX-1 LOOK. LAUGH. IX-1 ^{er} PU CAN.NOT IX-1 EXPLAIN. [RSL-s2-20]
 ‘I look. I laugh. I cannot explain it.’
 b. IX CAT THINK. (...)IDEA. IX [pause]/ RAIN.PIPE CL:CLIMB.IN [NGT-210-11]
 ‘The cat thinks. He’s got an idea. He climbs in a rain pipe.’

Therefore, we can conclude that prosodic boundaries are a clear marker of topics, while eyebrow raise and head tilt are probably not just topic markers, but rather markers of shifted – or more generally less accessible – topics. It might be the case that prosodic boundaries mark some special kind of topics as well (in the spirit of Aarons (1994)), but the size of the corpora does not allow us to make this conclusion.

To sum up, topic shift in RSL and NGT is an important factor in determining the type of marking for topics. In addition, the correlation between topic shift and overtness of topics in these languages for the most part parallels the correlation observed in spoken languages, although some modality effects are present as well.

3.5 Thetic sentences

In addition to having a topic marking strategy, RSL and NGT both have a separate strategy to mark thetic sentences, in other words, sentences containing only new information (Sasse 1987). This is a syntactic strategy, namely the subject appears in the post-verbal position (the VS order) (42a,b). There is usually no prosodic break between the verb and the subject, and there is never any specific non-manual marking associated with the subject. However, in a couple of examples (42c), there is a pause between the verb and the subject.

- (42) a. CL:COME TRAM [NGT-1718-71]
 ‘There comes a tram.’
 b. WINDOW APPEAR CAT [RSL-cr1-10]
 ‘There appears a cat in the window.’

- er
- c. OVER APP. FIVE MINUTE / CL:COME IX [pause] / ONE WOMAN IX [NGT-94-1]
 ‘In approximately five minutes, there comes a woman.’

The small size of the corpora analyzed here does not allow us to determine what happens with transitive verbs: whether the VS order would still be preserved. One could hypothesize that in the case of transitive verbs, such a strategy is unavailable, because the verb phrase would be split (VSO), and this is why we do not find such examples in the data. However, the size of the data pool is not large enough to support such a hypothesis.

The separate strategy to markthetic sentences is, however, optional. In most cases,thetic sentences have the same SV order as sentences with topics. Compare (43a) to (43b): both sentences express the same proposition ‘a telephone rings’, but in the former the order is SV, while in the latter it is VS. This means that a sentence with the unmarked word order and without non-manual marking on the subject, as (43a), can be interpreted either asthetic or as categorical. Examples (43c-d) demonstrate that the VS order is not obligatory inthetic sentences in RSL either.

- (43) a. TELEPHONE RING [NGT-1776-74]
 ‘A telephone rings.’ (SV)
 b. IX RING TELEPHONE IX [NGT-1716-71]
 ‘A telephone rings.’ (VS)
 c. GRANNY CL:COME [RSL-cr2-16]
 ‘There comes a granny.’ (SV, GRANNY not mentioned or implied before)
 d. IX MAN CL:STAND [RSL-cr4-10]
 ‘There stands a man there.’ (SV, MAN not mentioned or implied before)

One should also notice that the VS strategy forthetic sentences is much more common in RSL than in NGT: we find 25 examples in RSL but only 6 examples in NGT. This cannot be attributed to the differences in genres, because in RSL 18 examples come from the cartoon stories, and all NGT examples come from the cartoons stories as well, so a direct comparison is possible. The difference might be caused by contact: the VS order also characterizesthetic sentences in Russian (44), while it is not used in Dutch.

- (44) (What happened?) [Russian]
 priehal Tramvaj
 came Tram
 ‘A tram came.’

To sum up, RSL and NGT have a dedicated but optional syntactic strategy of markingthetic sentences. The optionality of this strategy in combination with the optionality of topic marking discussed in section 3.4 provide a basis for the discussion of topic prominence of RSL and NGT in the following section.

3.6 Topic prominence

The discussion of topic prominence of sign languages is a long-standing one (section 2.2). For several sign languages, researchers have explicitly claimed that they were either topic-prominent or not (for ASL, compare, for instance, McIntire 1982 to Liddell 1980). The claim that sign languages are highly context-dependent and that the order of elements is

governed more by the pragmatics than by grammatical rules is quite common among sign language researchers (Rosenstein 2011). Recently, two very different approaches have been applied to answer this question with respect to two sign languages: FSL (Jantunen 2007, 2013) and HKSL (Sze 2008). We discuss these approaches in section 3.6.1 and then apply them to RSL and NGT in section 3.6.2.

3.6.1 Topic prominence in sign languages

Jantunen (2007) demonstrated that FSL has topics that are marked by syntactic and non-manual markers and by the presence of prosodic boundaries – that is, very similar to topics in RSL and NGT. Both aboutness and scene-setting topics can be marked.³³ He further argued that scene-setting topics, possessor topics (“John, his father is dead”), and base-generated topics (“John, he is sick”) are not arguments of the main predicates. Using the terminology of Chafe (1976), Jantunen concluded that FSL topics are Chinese-style topics. It is therefore possible to infer that FSL is topic-prominent, as Chinese is the most famous example of a topic-prominent language. However, as is shown later, Sze (2008) has claimed that the presence of Chinese-style topics in a language per se does not suffice to categorize the language as topic-prominent.

Moreover, Jantunen (2013) explicitly claimed that FSL is discourse-oriented (a categorization which subsumes the notion of topic prominence). However, this claim is based mainly on the fact that ellipsis is very common in FSL, rather than on the presence and regularity of topic marking. Citing McShane (2005), Jantunen argues that FSL is discourse-prominent because it permits a great deal of ellipsis, and that thematic elements are mostly elided.

Sze (2008) has thoroughly analyzed the criteria that can be used to identify topic-prominent languages (based on typological data from spoken languages). The properties of topic-prominent languages used by Li and Thompson (1976), she argued, are not all valid. The lack of a passive construction, for instance, is not a good criterion because many Indo-European languages are subject-prominent but only have marginal passives. Therefore, she reversed the argument by claiming that if passives are widespread in a language, then it is probably subject-prominent. The same can be said about the presence of dummy-subjects: just like topic-prominent languages, many subject-prominent languages lack them, but only subject-prominent languages have them. She also provided counterexamples to the claim that topic-prominent languages are mostly SOV. She further argued that double-subject constructions (i.e. cases in which the topic has no syntactic relation to the sentence) are present in subject-prominent languages as well, so only prevalence of such constructions can be a sign of topic prominence. Taken together, she concludes that the only reliable features characterizing topic-prominent languages are the prevalence of the double-subject construction, the obligatoriness of surface coding of topics, and a lack of constraints on what can become a topic.

Sze also added a criterion from É. Kiss (1995), namely that in topic-prominent languages, there is an obligatory syntactic distinction betweenthetic and categorical sentences. She then applied all these criteria to HKSL and came to the conclusion that HKSL is not a topic-prominent language. Note that this finding is quite surprising in light of the fact that sign languages are generally argued to be highly discourse-oriented, and also in light of the

³³ Jantunen (2007) used a different terminology, but these categories can easily be identified.

fact that É. Kiss (1997) pointed out that, according to her definition, almost all European languages are topic-prominent.³⁴

3.6.2 Topic prominence in RSL and NGT

Applying Sze's criteria (2008) to RSL and NGT, it becomes clear that these languages cannot be considered topic-prominent either. First, RSL and NGT do not have dummy subjects (or at least, they have not been discovered yet). Secondly, to date only very little research has been done on passives in the two languages, but the overall impression is that passives are present but quite marginally. Thirdly, RSL and NGT do have a separate strategy to mark thetic sentences, but the examples discussed above have revealed that thetic sentences can also use the unmarked word order.³⁵

Furthermore, both RSL and NGT employ syntactic and prosodic (including non-manual) markers of topics.³⁶ However, topic marking is optional and mainly restricted to shifted topics. Therefore, this criterion for topic prominence does not apply either.

Double-subject constructions are in principle possible in both languages, and some examples are attested in the corpus data (see discussion in 3.3.1 and 3.3.3). However, they occur only infrequently, at least if scene-setting topics are not analyzed as double-subject constructions. Sze (2008) did not analyze them as such, while Jantunen (2007) did. We follow Sze (2008) in this respect and thus conclude that this criterion does not show that RSL and NGT are topic-prominent either.

Finally, topics appear to be restricted in RSL and NGT. Firstly, we have seen that mostly shifted topics are marked (and only shifted topics are marked by eyebrow raise and head tilts), which shows that there is a functional restriction. Secondly, in the data pool, aboutness topics are mostly noun phrases. However, there are some exceptions. The largest class of exceptions concerns *wh*-cleft-like structures. Many sign languages, including RSL and NGT, have constructions that resemble *wh*-clefts in spoken languages (45). Some researchers have claimed that they are indeed *wh*-clefts (Wilbur 1996), while others have argued for an alternative analysis (Caponigro and Davidson 2011). The “question part” (in (45): IX WHO DRIVE ‘who drives it?’) of the clefts is marked non-manually in a way similar to topics in RSL and NGT, namely by raised eyebrows and/or backward head tilt. It is therefore possible to analyze the “question part” as a topic, and under this analysis, the topic is definitely not a noun phrase. A detailed analysis of these constructions in RSL and NGT is outside of the scope of this chapter.

- (45) er+bht
IX WHO DRIVE / OBVIOUS BIRD SELF DRIVE [NGT-27-3]
‘The bird herself drives it [the tram].’ (‘Who drove it is the bird.’)

³⁴ According to É. Kiss (1997), in most European languages, including many Indo-European (Slavic, English, Dutch, Greek, Italian) and non-Indo-European (Hungarian, Finnish, Basque, Mingrelian) languages, the subjects remain within the Predicate Phrase in thetic sentences, while they obligatorily leave the Predicate Phrase in categorical sentences.

³⁵ Note, however, that there might be some tests which would show that the syntactic position of subjects in thetic sentences is different from the syntactic position of subjects in categorical sentences. É. Kiss (1996) demonstrated this for English, arguing that English is topic prominent as well. However, when analyzing corpus data, we are only able to assess that the surface SV order is used for both types of sentences.

³⁶ In addition, as discussed in chapter 6, both languages mark discourse topics with the help of weak hand holds. Again, this marking is not obligatory; moreover, it is quite rare.

In addition, there are several examples in RSL with VP or V-topics (the same is possible in ASL as well, see Aarons (1994)). For instance, in (46) the topic is the verb phrase IX CL:SIT ‘sits there’, while the comment is GRANNY. This should not be confused withthetic sentences with the VS order, because the subject GRANNY here is old information and the VP-topic is new and marked as a topic by eyebrow raise. Such examples have not been found in the NGT corpus, but given the low frequency of this phenomenon in the RSL corpus, it is not possible to claim that NGT does not allow this construction.

- (46) er
IX CL:SIT / GRANNY [RSL-cr5-20]
‘The granny sits there.’

HKSL is similar to RSL and NGT with respect to the topic prominence criteria, with one exception: it does not have a separate strategy forthetic sentences. It thus appears that, at least in this respect, RSL and NGT have a more elaborate system of IS marking; this system, however, is not obligatory.

To sum up, according to the criteria from Sze (2008), RSL and NGT are not topic-prominent. However, Jantunen (2013) discussed additional criteria of topic prominence that were not applied by Sze. It is clear that both RSL and NGT are discourse-oriented in the non-formal sense of this term that Jantunen (2013) applied: they have tools to mark IS, and they do permit a considerable amount of ellipsis, as section 3.4 on topic shift has clearly shown. Claiming that they are not topic-prominent and stopping at that misses this important fact. Therefore, it appears that the notion of topic prominence should be refined.

One possible solution is offered in Surányi (to appear), who suggests to make further distinctions between different types of discourse-configurationality. Among other notions, he distinguishes between strongly and weakly discourse-configurational languages: in the former, topics and/or foci must be syntactically marked, while in the latter, there are special syntactic positions that are only used to mark IS notions, but these notions are marked optionally. According to this definition, English would probably not even be classified as weakly topic-prominent, because there is no syntactic position used only for topics (fronting can actually target contrastive foci among others (Prince 1986)).

If we accept this classification of discourse-configurationality (or, more relevant for the current discussion, topic prominence), it is clear that RSL and NGT can only be called weakly topic-prominent because, although they have a dedicated topic position (and a special construction forthetic sentences), topics only optionally appear in these positions. HKSL, under this analysis, would be weakly topic-prominent as well, but probably even weaker than RSL and NGT, because it lacks special marking ofthetic sentences. This implies that topic prominence (and discourse-configurationality in general) should be seen as a scale rather than a categorical distinction. Even if there is a three-way distinction between strongly topic-prominent, weakly topic-prominent, and non-topic-prominent languages, weakly topic-prominent languages may still differ with respect to the amount of information structural categories that their grammars have. We return to this question in chapter 7.

3.7 Summary

At the beginning of this chapter, we formulated six research questions, and most of them can now be answered. The formal markers of aboutness and scene-setting topics in RSL are (i) sentence-initial position of the topic, (ii) a prosodic break following the topic, and (iii) non-manual markers, including eyebrow raise and backward head tilt. In NGT all these

markers are used but in addition, a topic is sometimes also marked by a clause-final pointing sign referring back to the topic of the sentence (sentence-final topic copying); this strategy was not evidenced in RSL.

Topics in RSL and NGT are not marked obligatorily. Some potential topics are not marked even prosodically. In addition, our analysis revealed that eyebrow raise and head tilt only mark shifted topics.

It appears that eyebrow raise and backward head tilt can be a realization of the same underlying feature associated with topics in both sign languages. Prosodic boundary marking is independent of non-manual marking: topics that are marked by prosodic boundaries but not non-manually show properties different from non-manually marked topics.

In both RSL and NGT, the VS order is used inthetic sentences. However, this strategy is optional, so the SV(O) order is also accepted inthetic sentences.

We have observed that despite RSL and NGT being unrelated and having had no or little contact with each other, IS is expressed in a very similar way in the two languages. Both languages mark topics (and use the same formal markers), and both have a syntactic strategy to expressthetic sentences. However, there are also some differences between the languages. Firstly, NGT (and not RSL) displays the phenomenon of sentence-final topic copying. Secondly, although NGT has the VS order strategy forthetic sentences, this strategy is much less commonly used than in RSL.

According to the criteria of topic prominence summarized by Sze (2008), RSL and NGT cannot be considered topic-prominent. Although they both have strategies to mark topics andthetic sentences, it turns out that this marking is optional. Other grammatical properties of RSL and NGT also do not justify their classification as topic-prominent languages, according to Sze's definition.

It is important to note that this study has certain limitations (discussed further in chapter 7). The size of the corpora used here is quite small, which does not allow for a detailed description of different types of topics and their properties. The small size of the corpora is caused by the very time-consuming procedure of annotation of signed texts, especially concerning the non-manual markers. However, recently, new technologies have appeared on the market (or will appear in near future) that will facilitate a continuation of this line of research based on much larger datasets.

For instance, the CoBaSiL project (Karppa et al. 2012) will make it possible to automatically annotate head and eyebrow movements, eye aperture, and mouth movements, and even to analyze the velocity of the movement of the hands, based on normal video-files. With the help of such software, an analysis of topic marking in RSL, NGT, and other sign languages on a large scale will become possible, and thus the results discussed in this chapter can be verified. It is expected that such new technologies will allow us to answer the following questions: What is the relation of eye aperture to topic marking? How exactly are eyebrow raise and head tilt related to each other? Are there any phonetic differences between non-manual markers in RSL and NGT? What are the exact properties of topics that are marked by prosodic boundaries in the absence of non-manual marking?

4. Focus

4.1 Introduction³⁷

As already stated (section 1.3), alongside topic, focus is one of the most important notions of IS. However, unlike topic, focus is not optional: every sentence has to contain some new information, which is the function of focus (Zimmermann and Onea 2011). As mentioned in section 2.3, focus marking in sign languages has received less attention than topic marking. However, available studies on various sign languages have shown that focus can be marked syntactically (for instance, by fronting and focus particles), as well as by manual and non-manual prosody (longer, larger and slower manual movement, accompanied by a variety of non-manual markers such as eyebrow raise, head tilts, and body leans). Focus in RSL, however, has not been studied before, and despite one study on NGT (Crasborn and van der Kooij 2013), many questions remain. This chapter aims at filling this gap in the research on IS, especially for RSL, but also for NGT.

In section 2.3.5, our research questions concerning focus were formulated (QF1-QF6) based on previous research. In this chapter, we describe syntactic (section 4.3), manual prosodic (section 4.4), and non-manual markers (section 4.5) (QF1). Throughout these sections, we also address the issue of different types of focus and their marking (QF2), the issue of focus projection (QF3), and we compare the RSL and NGT patterns (QF4). Section 4.6 discusses the interactions of different focus markers (QF5). In section 4.7, we describe the marking of contrast in RSL and NGT, which involves a modality-specific strategy (QF6). Finally, in section 4.8 we summarize the answers to all research questions.

4.2 Methodology

It is impossible to study focus marking using only corpus data. Focus in many sign languages, including NGT (Crasborn and van der Kooij 2013), is often marked by manual prosody, that is, by modification of movement and/or location of the focused sign. In order to determine the means used, focused signs have to be compared to unfocused versions of the same signs. This is more easily controlled in an experimental setting.

Previous research also shows that many factors play a role in the process of selection of the appropriate focus marking. These factors include the type of focus (information vs. contrastive focus), syntactic scope of focus (such as subject focus vs. VP-focus), and the type of the movement of the sign (hand-internal vs. path movement). To study how these factors interact in determining focus marking in RSL and NGT, it is again necessary to use elicitation to create a large enough data set.

Section 4.2.1 describes the sociolinguistic characteristics of the participants who took part in this study, section 4.2.2 the elicitation stimuli, and section 4.2.3 the procedure. Finally, section 4.2.4 discusses the annotation and analysis of the data in detail.

4.2.1 Participants

³⁷ This chapter is based on data from two research projects: one on focus in RSL, in collaboration with T.P. Davidenko and A.A. Komarova, and the other one on focus in NGT, in collaboration with E. Nauta.

For both RSL and NGT, ten participants per language were asked to take part in this research project. Their socio-linguistic properties are summarized in table 4.1 for NGT and table 4.2 for RSL.

Table 4.1. Sociolinguistic characteristics of NGT signers.

Signer	Sex	Age	Age of exposure	City of schooling	Deaf/HoH relatives
f1	male	33	0	Amsterdam, Sint-Michielsgestel	father, mother, aunt, uncle, cousin
f2	female	23	1	Amsterdam, Groningen	brother
f3	female	31	0	Rotterdam, Amsterdam, Groningen	father, mother, brother
f4	female	30	0/1	Amsterdam	sister
f5	male	29	1,5	Groningen	no
f6	male	24	1	Amsterdam, Groningen	no
f7	female	21	1	(regular schools)	no
f8	female	28	1,5	Groningen	no
f9	female	27	0	Amsterdam	sister
f10	male	46	0	Amsterdam, Leiden	grandfather, grandmother, father, mother, aunt, uncle

All the data (including sociolinguistic questionnaires) for the focus study were collected specifically for this project. The information provided in tables 4.1 and 4.2 thus differs from the information in tables 3.1, 3.2, 5.1, 5.2, 6.2, and 6.3 in chapters 3, 5 and 6. For instance, NGT signers are here not characterized with respect to the use of a particular regional dialect. It is difficult to determine the dialect based only on the limited data set collected here. On the other hand, information about the city where they attended special education schools is provided since it is often hypothesized that school has a major influence on the variety of the sign language used by a signer (for NGT, see Schermer, Fortgens, Harder, and de Nobel 1991). In addition, the data about deaf and hard-of-hearing relatives is provided for each signer, as this relates to the question of whether they can be considered native signers (this information is not available in Corpus NGT metadata). The same information is provided for RSL signers in table 4.2.

Table 4.2 Sociolinguistic characteristics of RSL signers.

Signer	Sex	Age	Age of exposure	City of schooling	Deaf/HoH relatives
1	female	32	0	Moscow	mother, father, aunts, uncles, grandparents
10	female	52	0	Moscow	mother, father, sister, husband, son
12	female	52	0	Moscow	mother, husband, 2 sons, daughter, niece
13	female	58	0	Kursk	mother, father, brother
16	female	31	0	Moscow	mother, husband, 2 sons, daughter, niece
19	male	57	0	Moscow	father, mother, sister, uncle, aunt, niece
20	female	43	0	Moscow	father, mother, husband son, daughter
28	male	34	0	Moscow	mother, wife
29	male	30	0	Moscow	father, uncle, aunt
30	female	25	0	Moscow, Odessa	mother, father, sister

The NGT data set contains recordings from four male and six female signers. The mean age at the time of recording was 29, ranging from 21 to 46 (note that nine of the ten signers are within the range 21-33). All of the signers were exposed to NGT from a very early age: six of the ten signers have deaf relatives, while in the remaining four cases the parents started learning NGT as soon as the hearing status of the child had been established. Still, this means that not all signers can be characterized as native. Due to the relatively small population of native signers in NGT, it was not feasible to be stricter in the selection of participants. Seven of the ten signers attended a school in Amsterdam (as well as other schools in most cases), two signers in Groningen, and one did not attend any of the deaf schools in the Netherlands. This difference can potentially lead to dialectal variation among the signers; unfortunately, the limited data set does not allow us to check this factor in detail. Given that the majority of the participants come from the Amsterdam region, we expect the data reported here to be representative of this dialect.

The RSL data set contains recordings from three male and seven female signers. The mean age at the time of recording was 41, ranging from 25 to 58. The group of RSL signers is therefore older on average than the group of NGT signers. All of the RSL signers had exposure to RSL from birth due to the presence of deaf signing relatives. Eight of the ten signers lived and went to school in Moscow. One signer was born in Odessa (a city in Ukraine) and moved to Moscow in her childhood where she attended a school for the deaf. One signer was schooled in Kursk and moved to Moscow in adulthood. Therefore, some dialectal variation might be present in this population as well. The limited data set again does not allow any check on whether dialectal variation is present; however, given the fact that the two signers not born in Moscow have lived there for many years, we expect the dialectal variation to be minimal, and the data to be representative of the Moscow dialect.

To sum up, for both languages, data from ten signers are used. NGT signers are slightly younger on average than RSL signers but this is probably not crucial for the comparison. In addition, the NGT group contains four signers that cannot be characterized as native

according to the strictest definition. In sections 4.3.1, 4.4.7 and 4.5.8, we will show that the heterogeneity of the NGT group does not play a role in the expression of focus markers (syntactic, manual, and non-manual correspondingly), as in general, there are no differences between native and non-native signers.

4.2.2 Elicitation material

In previous studies on sign languages, several factors influencing focus marking were identified (see section 2.3). These factors include the type of focus (information vs. contrastive focus), syntactic scope of focus (such as subject focus vs. VP-focus), and a phonological factor, namely the type of the movement of the sign (hand-internal vs. path movement). Sentences involving different combinations of these factors were therefore elicited.

As described in sections 1.3 and 2.3, the main distinction made is usually between information focus and contrastive focus. However, contrastive focus can be further subdivided into several types. In this research project, three focus types are compared to each other: information focus, selective focus, and corrective focus, the former being non-contrastive and the other two being subtypes of contrastive focus. Information focus can be elicited using a *wh*-question (1a); selective focus can be elicited in the same way but with alternatives provided (1b); corrective focus can be elicited using incorrect information in the question followed by a confirmation request (1c).

- (1) a. WHO BITE MAN? [RSL, question 2³⁸]
 ‘Who bites the man?’ Expected response: ‘A dog.’
- b. WHO WALK: BOY GIRL? [RSL, question 10]
 ‘Who is walking: a boy or a girl?’ Expected response: ‘A boy.’
- c. IX SLEEP CAT, CORRECT? [RSL, question 17]
 ‘A cat sleeps there, right? Expected response: ‘No, a dog sleeps there.’

Each question was preceded by a picture and was related to the content of the picture. For instance, the picture in figure 4.1 was followed by the question in (2), with the expected response ‘No, the man is pushing a girl.’



Figure 4.1. Picture used to elicit focus, followed by question in (2), taken from Skopeteas et al. (2006).

³⁸ See Appendix A1 for the full list of questions.

- (2) MAN BIKE FIX, CORRECT? [RSL, question 22]
 ‘A man is fixing a bike, right?’

In addition, a fourth focus type has been elicited using pairs of pictures with contrastive referents, taken from the QUIS manual (Skopeteas, Fiedler, Hellmuth, Schwarz, Stoel, Fanselow, Féry, and Krifka 2006). For instance, the first picture depicted a cat and a dog, while in the second picture, the cat was biting a girl, and the dog was biting a boy. This type of pictures is supposed to elicit contrastive foci and topics in general (see also Appendix A1). The signers were asked to describe the pictures consecutively. This type of focus was only elicited with the help of four pictures, and it was not combined with the other factors; therefore, the resulting sentences are excluded from quantitative analysis in sections 4.3-4.5, but they are analyzed qualitatively (see further discussion in section 4.2.4.6).

The second factor is the syntactic scope of the focus, that is, the constituent that is in focus. Due to time limitations, we only considered the following five focus scopes: subject focus (3a), object focus (3b), VP-focus (3c), V-focus (3d), and sentence-focus (3e).

- (3) a. IX BOY WHO CL:HIT ON? [NGT, question 1]
 ‘Who is hitting the boy?’ Expected response: ‘A girl.’
 b. GIRL PERSON IX KISS WHO: FATHER OR MOTHER? [NGT, question 11]
 ‘Who is the girl kissing: her father or her mother?’
 Expected response: ‘Her father.’
 c. MAN PERSON WHAT DO IX? [NGT, question 6]
 ‘What is the man doing?’ Expected response: ‘He is carrying a boy.’
 d. MAN EYE.OPEN, RIGHT? [NGT, question 38]
 ‘A man opened his eyes, right?’ Expected response: ‘No, he closed his eyes.’
 e. WHAT HAPPEN? [NGT, question 8]
 ‘What is happening? Expected response: ‘A house is burning.’

With regard to the third factor, type of movement, it is important to note that generally two major types are distinguished: hand-internal movement (only hand-internal joints are involved, HI) and path movement (P). This difference can be relevant for some of the manual prosodic markers of focus: it is easily possible to enlarge a path movement; however, the size of the hand-internal movement is very constrained. Therefore, we designed test sentences that included target signs with both path and hand-internal movements. Examples of the signs with different movement types are provided in section 4.2.4.1, where we pursue this issue further.

These three factors resulted in 30 possible combinations (excluding the four test items to elicit contrastive foci and topics). Admittedly, in a real experimental set-up, it would be necessary to have several items for every combination of factors, and probably also some unrelated fillers. However, this would have resulted in a very long set of test items, which in turn would have required more than one elicitation session, or a large number of signers, both of which was not practicable. Consequently, for every combination of the three factors, only one test item was created. The procedure should therefore be better seen as controlled elicitation, rather than experimental.

Every attempt was made to create a test that was as similar as possible for RSL and NGT. We tried thus to use the same signs in focus and the same pictures to elicit the answers. However, some signs have hand-internal movement in RSL but path movement in NGT, or vice versa, and therefore the pictures and the questions themselves are often slightly different (see Appendix A1).

In addition, from the pilot it emerged that some of the test items contained a movement of a different type than expected. To remedy this we decided not to remove such test items, but

to add some items so that every combination of factors appeared in the test at least once (4 items for NGT and 5 items for RSL). This also means that some of the combinations of factors appeared twice in the final version of the test. Table 4.3 lists all the combinations of factors which were represented by two test items in the final version. All other combinations of factors are represented by only one item.

Table 4.3. Combinations of factors in RSL and NGT represented by two test items in the final design. Each cell provides focus type, focus scope, and movement type (HI – hand-internal, P – path).

RSL	NGT
information – subject – HI	information – subject – P
selective – subject – P	information – object – P
corrective – object – P	selective – subject – HI
corrective – subject – HI	corrective – object – P
corrective – VP – P	

As mentioned in the beginning of this section, the main methodological challenge was to collect data containing both a version of the sign in focus and a version not in focus. One possibility frequently used is to ask the participant to answer questions in the form of full sentences. So, for instance, if the question is “Who did the boy see?”, the participant is instructed to answer “The boy saw a girl”, not just the elliptical “A girl”. The noun phrase “the boy” in the full answer would therefore not be in focus and could later be compared to the same noun phrase in focus. However, this procedure has the disadvantage of forcing the participants to produce unnatural answers to questions. First, as described for many sign languages (see also section 3.4), ellipsis is a very common phenomenon, meaning that full answers would be unnatural or at least atypical. Second, during elicitation of sign language data, there is always a risk of influence of the spoken language, and in the situation of a task where no ellipsis is allowed, the signers may turn to spoken language structures.

In order to avoid instructing the signers to produce full answers, it was decided to ask the signers to first repeat the question, and then answer it. For instance, if the question was “Who did the boy see?” the participant should first repeat the question and then answer it with “A girl” (or “The boy saw a girl”). The noun phrase “the boy” that constitutes a part of the question is not in focus; therefore, it can be compared to the same noun phrase in focus in a different test item. Admittedly, this procedure is also not ideal, as repeating questions is not a very natural task either. However, the most crucial part – the answer to the question – is not forced in this procedure, and the participants are free to use ellipsis. In addition, there is no reason to expect that non-focused signs in questions and non-focused signs in answers would be realized differently. Additional questions had to be created to match some of the answers: nine more questions for RSL and ten for NGT (see Appendix A1 for the full list of these questions).

Finally, to avoid making the task extremely time-consuming, some of the signs in items with sentence focus were not provided with non-focused comparisons. Since answers with sentence focus are expected to contain two or three signs (subject, verb, and sometimes object), it would be necessary to create non-focused comparisons for all these. The comparison of focused and non-focused versions of signs was thus completely possible for four focus domains: subject focus, object focus, verb focus, and VP focus. Some of the items in the sentence focus condition have non-focused equivalents as well, but not enough to allow systematic analysis. We discuss the consequences of this decision in section 4.2.4.

The resulting test battery consisted of 48 sentences for RSL and 49 sentences for NGT (table 4.4). Some of the items were only there to elicit non-focused versions of signs, so the test items for which focus marking was analysed were 39 in both languages. Every test item consisted of a picture and a question in NGT or RSL about this picture (the details of the procedure are spelled out in the next section). All test items (in English) can be found in Appendix A1.

Table 4.4. The battery of test items for RSL and NGT classified by functions

Type of item	Number of items	
	RSL	NGT
Initial test items for the combination of the three factors	30	30
Additional test items for the missing combinations	5	4
Items for contrastive topics and foci	4	4
Additional question to elicit non-focused signs	9	10
Total	48	49

4.2.3 Elicitation procedure³⁹

The participants viewed all the pre-recorded stimuli on a laptop screen, in a Power Point presentation. First, the participants watched a signed (RSL or NGT) explanation of the procedure. In this instruction, they were informed that they would see a picture followed by a question in their respective sign language. They were further instructed to first repeat the question and then answer it, after which they had to go to the next picture. They had to go through the presentation at their own pace, using the keyboard of the laptop. The participants were also asked to sign as naturally as possible, and not to use a sign system (Signed Russian or Sign-supported Dutch). Finally, they were informed that the whole procedure would take about 20 minutes. The participants were also instructed on the video that the research addressed the relation between questions and answers in RSL/NGT. The term “focus” was not mentioned, and neither was the relevance of non-manuals or manual prosody to prevent influencing the responses.

During the recording, the signer was seated on a chair, and the laptop was placed on another chair in front of the signer, slightly to one side. For both RSL and NGT recordings, there was a neutral background behind the signer. Two digital high-definition video cameras were recording the session: one from the front and one from the side. The signers were informed of the presence of both cameras. For all participants within a language group, the addressee was the same person. In both cases, this person was a native signer and a collaborator on this project. The same person also signed the instruction and questions beforehand. The addressee was placed behind the camera in front of the signer, so that the signer could sign naturally to the addressee. This had the additional benefit that any potential accommodation to the addressee should be similar.

The test items were presented in pseudo-random order: questions meant to elicit the same focus type and/or the same focus scope were never presented adjacently. The elicitation session lasted 15-30 minutes; in most cases, it took approximately 20 minutes. In the informal evaluation afterwards, the participants generally indicated that they found the task interesting and not very difficult, although one or two reported to have been exhausted by the end.

³⁹ This research was approved by the Ethics Committee of the Faculty of Humanities (University of Amsterdam).

Upon completing the task, participants were asked to fill in a short written socio-linguistic questionnaire containing questions on their date of birth, deaf and hard-of-hearing relatives and attended schools, as well as a self-estimate of the age at which they were first exposed to sign language. The data from this questionnaire was already reported in section 4.2.1 on the sociolinguistic properties of participants. In addition, they were asked to give their written consent on the informed consent form allowing for the use of their language samples for the purposes of research and presentations.

4.2.4 Analysis

In this section, we discuss the annotation and analysis of the data in detail, in subsections devoted to syntactic, manual prosodic, and non-manual markers, and their interactions (sections 4.2.4.2–5). However, before we do that, we have to discuss a change in the coding of types of movement (section 4.2.4.1). In addition, we discuss the analysis of test items based on the QUIS manual that were used to elicit contrastive topics and foci separately in section 4.2.4.6. Finally, we discuss the reliability of the analyses applied here in section 4.2.4.7.

In the first place, we glossed all the answers produced by our signers with the help of sign-by-sign translation. It was possible to unambiguously identify all of the signs used due to the limited contexts being elicited.

Not all of the collected data turned out to be analyzable. For instance, sometimes the participant did not understand the question or gave a wrong answer. In a number of items, a clear effect of Russian or Dutch was detected – for example, when a fingerspelled preposition was used. Such items were discarded from further analysis. In the analysis of manual prosody, some of the non-focused signs were missing due to the design of the study (see section 4.2.4.3). In addition, sometimes the signers used a different variant of a sign in focus as compared to the non-focused sign. In such cases, a comparison was impossible, so the manual prosody data on these items is missing. However, such test items were still analyzed with respect to non-manuals and syntactic markers. Finally, unclear cases (for instance, the cases in which the non-manual was not clearly identifiable) were also excluded from the quantitative analysis, but only for the analysis of the unclear parameter.

The resulting data set contains 330 sentences for NGT (from a maximum of 340) and 332 for RSL (from a maximum of 350), excluding the additional sentences elicited for questions only or to study contrast with the QUIS elicitation materials. Not all of the signs are analyzed with respect to manual prosody or according to non-manual marking, as we will discuss in the following sections (4.2.4.2-4). The exact numbers for each measurement are provided in the relevant parts of sections 4.3-5.

4.2.4.1 *Rethinking types of movement*

During the annotation procedure, it became obvious that signs with path movement do not behave uniformly with respect to manual prosodic markers. They fell into two groups: signs with larger and less constrained path movement and signs with smaller path movement. It was therefore decided to distinguish three types of movement in the analysis: hand-internal (HI), small path (SP), and “normal” path movement (P).

In signs with hand-internal movement, one or more of the joints in the palm – from metacarpophalangeal to more distal – are used (examples of such signs in RSL: DOG, GUITAR; in NGT: MAN, WOMAN), see figure 4.2. In the signs with small path movement, more proximal joints can be used, but the path is small in size (examples of such signs in RSL: GIRL, BOY; in

NGT: DOG, FATHER), see figure 4.3. Signs with normal path movement are larger in size (examples of such signs in RSL: KISS, BIKE; in NGT: CAR, PUSH), see figure 4.4.



Figure 4.2. Hand-internal movement in the NGT sign MAN (first and last frame).



Figure 4.3. Small path movement in the RSL sign GIRL (first, middle and last frame; in the second frame, the hand touches the chin).

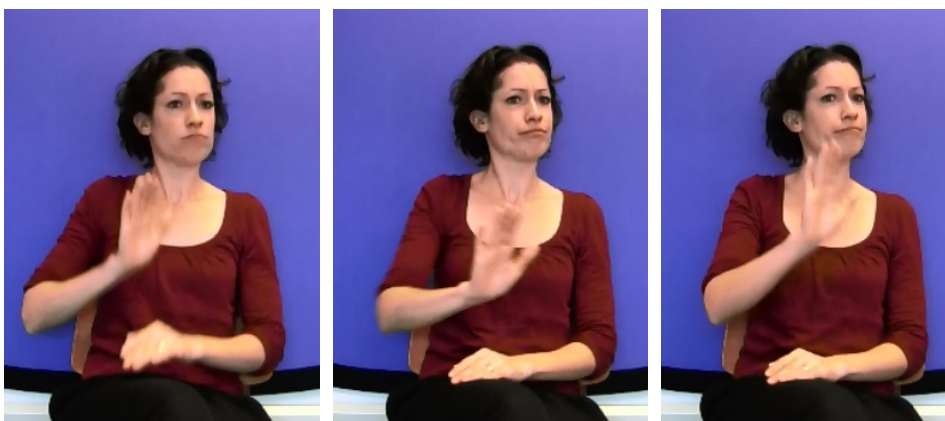


Figure 4.4. Normal path movement in NGT sign PUSH (first, middle and last frame).

As already mentioned, signs with a hand-internal and small path movement may behave differently due to the fact that the latter type of movement can be physiologically made larger in trajectory, while the former cannot. On the other hand, a small path movement and a

normal path movement are both unconstrained with respect to size modification, but they differ in that enlarging the small path movement results in a considerable change in the form of the sign, while this is not true for normal path movement. We therefore expected small path movements to be less frequently enlarged. As the analysis in section 4.4 shows, the difference between the three types proved to be indeed relevant for focus marking.

Note, however, that since the three-way distinction has been applied only post-hoc, the construction of the data set is not balanced with respect to this parameter. Since the category of signs with normal path movement has been divided into two new categories, the test battery no longer contained test items for all combinations of factors. Although the statistical analysis discussed in sections 4.2.4.2-4 is quite appropriate for unbalanced data, further research is necessary to study the influence of the type of movement in detail. In future research projects, three types of movements should thus be included in the design from the very beginning.

4.2.4.2 Syntactic markers

As described in section 2.3, focus is marked syntactically in many sign languages. For instance, in ASL the focused constituent can be topicalized, and in many sign languages, including ASL and LSB, focus is connected to doubling (Lillo-Martin and de Quadros 2008). In addition, the non-focused parts of the utterances are often elided (Jantunen 2013), and, although it is not a direct marker of focus, ellipsis thus marks focus indirectly. Furthermore, in some (spoken) languages, IS in general and focus in particular has influence on the VO vs. OV order. Finally, some sign languages have been described as using focus particles, which can be yet another marker of focus (Herrmann 2013). The data from RSL and NGT were therefore examined for any use of these five markers: fronting, word order, doubling, particles, and ellipsis.

Fronting. Word order of every answer was coded with such labels as S, V, and O. As we will discuss when presenting the results in section 4.3.1, no further analysis was necessary.

Word order. For the VO vs. OV distinction, we coded every sentence containing an object and a verb as either OV or VO (sentences with verb doubling were excluded from this analysis). Then we examined how different focus scopes interact with these two orders. If focus plays a role in determining the position of the object, we would expect to find differences between object focus, VP and sentence focus, and other types of focus. In the first case the object is the focus, in the second case the object is a part of focus, and in the third case the object is not in focus (see results in section 4.3.2).

Doubling. We coded for every answer whether any constituent has been doubled and, when this was the case, further specified the type of doubling with constituent labels, such as V O V, or V S V, N N, etc. As we discuss in section 4.3.3, this coding is sufficient for the description of doubling for focus in RSL and NGT.

Focus particles. We simply looked at all elements that expressed such meanings as *only*, *also*, or *even*. Note that since we did not design the experiment to elicit such elements, we did not expect to find many of them (see results in section 4.3.4).

Ellipsis. Ellipsis itself is not a marker of focus; however, it usually interacts with focus in the following way: only constituents that are not in focus can be elided (e.g. Who sees the boy? *(The girl) sees the boy). This also means that ellipsis indirectly marks focus: if everything apart from focus is elided, the identification of the focused constituent becomes very simple.

We therefore classified each of the sentences produced according to whether it contained only focused information or not. Note that we did not try to classify each sentence with respect to ellipsis per se: if, for instance, in the case of object focus, only the subject was elided, the sentence was still coded as not focus-only, as in such a situation, ellipsis did not clearly mark focus.

In order to find out whether ellipsis interacts with focus type or with focus scope, we applied a multifactorial statistical analysis. This approach is used to determine whether multiple factors (in this case, type of focus and focus domain) and their interactions influence the dependent variable (in this case, whether the answer was focus-only or not) by fitting a regression model to the data. Note that this approach can be applied to unbalanced data (which is exactly what we need). Since the dependent variable is binary, we applied binary logistic regression (Gries 2009), starting from the model with all factors and interactions and proceeding to the smallest possible model by dropping the non-significant factors and interactions. Note that this analysis cannot be applied to the cases of sentence focus, as they are trivially always non-elided. To keep the data parallel to the analysis of manual prosodic and non-manual markers, we also excluded VP focus from the quantitative analysis of ellipsis (see sections 4.2.4.3-4 for the motivation). This left us with 210 sentences for RSL and 217 sentences for NGT (see results in section 4.3.5).

4.2.4.3 *Manual prosodic markers*

In section 2.3.2, we discussed that focus is marked by manual prosody in many sign languages, including ASL and, according to Crasborn and van der Kooij (2013), NGT. Previous research has shown that, in comparison to their non-focused counterparts, signs in focus may contain more repetitions, can be longer, larger in trajectory, and slower in velocity. Additionally, some signs have been reported to be located higher when in focus. Therefore, we coded our RSL and NGT data for all these parameters. As discussed in section 4.2.2, non-focused variants of focused signs were elicited. These non-focused variants were compared to the focused variants of the same signs by the same signers.

Length of the sign. The length was measured in ELAN, from the first frame in which the handshape and the location of the sign were fully formed until the last frame where either handshape or location was dismissed. Length was categorized in comparison to the non-focused version of the sign: as longer, shorter, or of the same length (see results in section 4.4.1).

Number of repetitions. We coded whether the movement contains more/less/the same amount of repetitions in comparison to the non-focused sign. Sometimes the sign in focus contains a full repetition of the single movement of the sign not in focus. In a more complex case, the underlying movement can be bidirectional, that is, it contains two movement units in opposite directions (as in the NGT sign VIOLIN, where the hand moves to the right and then to the left). When in focus, a sign of this type would often contain three movement units: the hand moved to the right, then to the left, and then to the right again. Although, strictly speaking, the full movement of the sign is not repeated, this was annotated as additional repetition (see results in section 4.4.2).

Speed of movement. The velocity of the hands was estimated, and was categorized as either faster, slower, or with the same speed as the non-focused version (see results in section 4.4.3).

Size of movement. The distance travelled by the hands was estimated. Again three categories were distinguished: larger, smaller, or with the same size as the non-focused version (see results in section 4.4.4).

Location. The height of the sign was estimated with respect to the body of the signer. Three categories were distinguished: higher, lower, or has the same height as the non-focused sign (see results in section 4.4.5).

These markers are of course not fully independent from one another. Length is a cumulative measure that is dependent on the size of movement (the larger the sign, the longer it is), speed of movement (the slower the sign, the longer), and number of repetitions (the more repetitions, the longer the sign). However, length is not reducible to these three factors, because a sign can also be made longer by adding a hold at the end without modifying the other prosodic parameters. This justifies discussing length as a separate marker here.

Although the number of repetitions and length are more objective measures, size of movement, speed of movement, and location are highly subjective.⁴⁰ The video-recordings of the assessed signs were played at half or quarter speed multiple times to assure correct identification of the differences. The reliability of this procedure is evaluated separately in section 4.2.4.7.

To ensure that the procedure was not biased towards the hypotheses, we decided to underestimate rather than overestimate the differences. This meant that if two signs were very close in length, size of movement, speed of movement, or location, we classified them as having no difference according to these parameters. In the case of small differences, the chance of there being an error in estimation (in both directions, for instance, assessing either the focused or non-focused sign as longer) is very high. Furthermore, large differences are more likely to fulfill a linguistic function (that is, mark focus) and not be just a coincidental contextual effect. This decision might have led to general underestimation of manual prosodic markers of focus in both RSL and NGT, but the differences reported are likely to be valid.

The statistical analysis tested whether the five markers are influenced by type of focus, type of movement and focus scope, using again a multifactorial statistical analysis. The three types of focus (information, selective, and corrective: section 4.2.1) and the three types of movement (HI, SP and P, section 4.2.4.1) were used in the analysis. Only three focus scopes (subject, object and verb focus) were used in the analysis since, as mentioned in section 4.2.2, it was not possible to collect all non-focused versions of signs. Moreover, in the cases of VP and sentence focus, more than one sign can potentially be marked with manual prosodic markers, making it much more difficult to apply statistical modelling. The markers that are used in VP and sentence focus will be described without any quantitative analysis (section 4.4.6). Removing sentences with VP focus and sentence focus, as well as items for which the non-focused variant was missing, resulted in 149 signs for RSL and 188 signs for NGT.

Initially the prosodic markers were coded as variables with three possible values: for instance, the focused sign was coded as longer, of the same length, or shorter than the non-focused counterpart. However, after the coding, it became clear that focused signs are only rarely shorter, smaller etc. than the non-focused counterparts. For instance, in NGT, signs in focus are longer than their non-focused counterparts in 63% of the cases, and shorter in 7% of the cases, and in RSL, they are longer in 64% of the cases, and shorter in 11% of the cases. Table 4.5 below summarizes these relations between focused and non-focused signs for different markers. From this table, it is clear that focus can be marked by a longer, slower,

⁴⁰ Location is also subjective because the linguistically relevant definition of location is based on the position of the hand with respect to the signer's body, and not with respect to the boundary of the screen, and the position of the signer's body is variable (otherwise it would be possible to measure the location objectively).

larger, and/or higher articulation of signs, and by signs containing more repetitions than their non-focused counterparts. The opposite scenario is very rare and is therefore most likely to be caused by some additional factors: for instance, the non-focused version of signs could have been accented by the signers, despite the fact that they were supposed to be unaccented in questions.

Table 4.5. Prosodic markers in RSL and NGT. The column focused > non-focused contains the numbers (and percentages in brackets) of signs for which focused versions were longer/slower/larger/higher/ contained more repetitions than their non-focused counterparts. The column non-focused > focused reflects the opposite situation.

		focused > non-focused[1]	focused < non-focused[2]	total	Ratio between [1] and [2]
Length	NGT	119 (63%)	14 (7%)	188	8.5
	RSL	96 (64%)	16 (11%)	149	6
Repetition	NGT	68 (36%)	7 (4%)	187	9.71
	RSL	65 (44%)	7 (5%)	149	9.28
Speed	NGT	42 (22%)	10 (5%)	188	4.2
	RSL	30 (20%)	15 (10%)	149	2
Size	NGT	50 (27%)	8 (4%)	188	6.25
	RSL	21 (14%)	9 (6%)	149	2.33
Height	NGT	31 (17%)	7 (4%)	188	4.43
	RSL	15 (10%)	3 (2%)	149	5
<i>average</i>					5.7

For instance, in NGT signs in focus are longer than their non-focused counterparts in 63% of the cases, and shorter – in 7% of the cases, which means that the latter situation is atypical. This is also reflected in the ratio between the occurrences of the two scenarios: in this case it is 8.5, which means that focused signs are longer 8.5 more often than they are shorter. The average ratio for different prosodic markers is 5.7, which means that in general the focused signs are considerably longer, larger etc.

Therefore, for the statistical analysis, we collapsed the prosodic marker variables into two possible levels: for instance, a focused sign can be coded as either being longer or not longer (which subsumes shorter and same length) than its non-focused counterpart. Since from table 4.5 we know that only one value of each prosodic marker is used to mark focus, it is reasonable to collapse the other two values. However, in the results below, we always also report the numbers and percentages of cases in which the focused sign was shorter/smaller/faster etc., for the completeness of the picture.

We applied binary logistic regression (Gries 2009), starting from the model with all factors (type of focus, type of movement, and focus scope) and all interactions and proceeding to the smallest possible model by dropping the non-significant factors and interactions using single term deletions. Interactions of the factors were never significant, so in the results sections, we only discuss the influence of single factors (section 4.4). In addition, a logistic regression model was applied to assess the significance and effect size of the selected models.

4.2.4.4 Non-manual markers

As discussed in section 2.3.3, focus can be marked non-manually in many sign languages, including NGT (Crasborn and van der Kooij 2014). Crasborn and van der Kooij describe

eyebrow raise, backward head tilt, head nods, body leans, mouthing, and eye gaze as all being associated with focus in NGT, and some of these markers have also been described for other sign languages. Therefore, these six non-manual markers were also considered in the present study.

Eyebrow movement: eyebrow raise, eyebrow furrowing, or combination of the two were described (see results in section 4.5.1).

Head tilt: backward, rightward, leftward, forward and downward head tilts and their combinations were annotated (see results in section 4.5.2).

Body lean: backward, rightward, leftward, forward and downward body leans and their combinations were distinguished (see results in section 4.5.4).

Head nod: a distinction was made between large and small (shallow) head nods. We identified large head nods as being larger in trajectory, slower in velocity, and often occurring once, and shallow head nods as being smaller, faster, and mostly repeated (see results in section 4.5.3).

Mouthing: mouthing (articulation of spoken words), mouth gestures (typically accompanying verbs), and lack of mouthing were used as categories (see results in section 4.5.5).

Eye gaze: the general direction of the eye gaze (to the addressee, sideways, downwards, to the laptop screen) was recorded (see results in section 4.5.6).

We can only be sure that a non-manual marker is used to express focus if it does not have any other functions. Previous research (see for instance chapter 3, but also references in chapter 1) has shown that all the non-manuals being analyzed here may fulfil other functions than focus marking. Eyebrow movements, head tilts, head nods, and body leans, apart from having grammatical functions, can be used emotionally. Mouthing is probably a normal behavior of signers: signs both in focus and not in focus are often accompanied by it; in addition, it is used to distinguish nouns from verbs (Kimmelman 2009a). Similarly, eye gaze at the addressee is a regularly observed behavior in the sense that the signer looks at the addressee most of the time. As discussed earlier, the only reliable way to establish that a non-manual marker is used to mark focus is to compare its frequency in accompanying focused vs. non-focused signs. Note, however, that in the case of non-manuals, we cannot compare focused signs in answers with non-focused counterparts in questions, because in both sign languages, question marking involves at least eyebrow raise and head tilts, but probably also some other non-manual markers. As described in section 4.2.2, it was decided not to ask for full sentences due to the lack of naturalness. For mouthing and eye gaze, we therefore looked only at sentences which contained non-focused material, and characterized them in terms of mouthing and eye gaze marking of focused and non-focused parts. This was possible because mouthing and eye gaze at the addressee are used practically in every sentence. Most sentences with non-focused material were thus eligible for analysis (100 sentences for NGT and 168 for RSL in the case of mouthing, and 115 sentences for NGT and 144 for RSL in the case of eye gaze).

The evidence for other non-manual markers turned out to be scarce. Therefore, we decided to combine focus-only sentences with not focus-only ones for the quantitative analysis. For instance, if in a focus-only answer with subject focus the subject was marked with eyebrow raise, we counted this non-manual as marking focus. This leaves the possibility that in the cases of focus-only sentences the non-manuals are not marking focus, but have some other function. However, in section 4.6, we provide a counterargument by showing that frequency of these non-manuals is not significantly different whether the sentence is focus-only or not. In other words, if we compare sentences with focus marked by eyebrow raise, there is no difference between focus-only and not focus-only answers. Therefore, this

analysis gives us a decent approximation of how often focus is marked by a particular non-manual marker.

Similar to the analysis of syntactic markers, the statistical analysis was applied to only three focus scopes: subject, object and verb focus, for the same reasons. The description of how these markers are used in VP and sentence focus, but without a quantitative analysis, is presented in section 4.5.7. In some sentences, non-manuals were not clear, or the sentences had to be excluded due to the influence of spoken languages, or due to the presence of some complications, such as emotional expressions. This resulted in the following numbers of sentences: for eyebrows 183 in RSL and 202 in NGT; for head tilts 177 in RSL and 198 in NGT; for body leans 196 in RSL and 204 in NGT; for head nods 207 in RSL and 198 in NGT.

As with syntactic markers, a multifactorial statistical analysis was used to examine the influence of type of focus and focus scope. Type of movement should not play a role in the choice of a non-manual marker.⁴¹ Since it again turned out that interactions of the factors were never significant, we will only discuss the influence of single factors in section 4.5. In addition, a logistic regression model was applied to assess the significance and effect size of the selected models.

4.2.4.5 Analysis of interactions of syntax, manual prosody, and non-manuals

Once we determined which markers of focus are used in RSL and NGT in the syntactic, manual prosodic, and non-manual domains, possible interactions between these markers were analysed. We hypothesized that RSL and NGT may employ two different strategies: syntactic, manual prosodic, and non-manual markers may either be used in complementary distribution, or they could be used in combination to express focus.

A first inspection of the data, revealed many instances where manual and non-manual prosodic markers of focus were combined. Nevertheless we applied statistical analysis to find out whether there are any interactions between the markers, that is, whether for instance non-manuals are used less in the presence of manual prosodic marking of focus, or whether ellipsis leads to a decreased use of manual prosodic markers. In other words, we tested whether markers compensate for each other's absence. Here, we again applied multifactorial analysis, in some cases reduced to the χ^2 test. The results of this analysis are presented in section 4.6.

4.2.4.6 Analysis of QUIS test items

As discussed in section 2.3, contrast in some sign languages is expressed through a modality-specific mechanism, namely, contrastive referents are contrastively localized, and in addition sideward body leans and dominance reversal are used to emphasize contrast. Four items from the QUIS manual were used to elicit contrastive situations, in order to find out whether in these situations the expected contrast markers would be used.

Since only four such items were collected per participant, we did not aim to control for such factors as type of movement and syntactic scope. This part of the research was purely exploratory: we wanted to find out how such contrastive situations would be expressed. Therefore, the resulting responses were glossed with sign-by-sign translations and coded for non-manuals. No quantitative analysis is possible at this stage. The descriptive results are discussed in section 4.7.

⁴¹ In fact, for the sake of completeness, we also tested whether type of movement interacts with non-manual marking, but expectedly found out that it does not. This issue is not discussed further.

4.2.4.7 Reliability of analysis

The results reported in sections 4.3-7 are not based on any automatized coding. Coding for syntactic patterns, such as ellipsis, or doubling, is not a challenging task, as the categories are clearly identifiable. However, manual prosodic and non-manual markers are more subjective and more difficult to code. This is an important issue in sign language research, but very few studies report on reliability. We therefore decided to test the reliability of (some of) our coding.

For the manual prosodic parameters, we conducted a small additional experiment, in which hearing non-signers were asked to compare pairs of signs from our data according to the manual prosodic parameters used, namely length, number of repetitions, speed of movement, size of movement, and location. Since this experiment is not directly related to the content of this chapter, it is reported in detail in Appendix A2; however, its results are briefly summarized here.

The non-signers did not show a very high degree of agreement with the judgments made in our coding. In Appendix A2, we discuss different measures, but even the most optimistic one gave only an average agreement of 0.74 (ranging from 0.6 to 1, on a scale from 0 to 1, where 1 shows full agreement, and 0 no agreement except by chance). However, it is clear that the disagreement is caused by the fact that linguistically relevant differences in manual prosody are sensitive to linguistic context, which non-signers are not aware of and cannot accommodate for. For instance, this happens when the height of the sign is assessed with respect to the frame boundary, and not with respect to the signer's body, which would be more plausible linguistically. Another common challenge for the non-signers is to consider only the lexical movement of a sign, abstracting away from the transitional movements surrounding the sign. After careful reassessment of the test items, taking into account the non-signers' judgments of the results, we concluded that out of the 40 test items chosen for the reliability study only one had been coded incorrectly by the researcher. Therefore, the coding seems reliable enough for the research conducted.

A comparable reliability testing for the coding of non-manual markers was considered impossible at this point since these markers are much more sensitive to the linguistic context. They also interact with emotional expressions (Weast 2008), making the use of non-signer coders almost impossible. This testing therefore has been left for future research.

Our results on reliability emphasize again the point that in the future, more objective tools are needed to code for manual prosodic and non-manual markers. A group of researchers is presently working on an application that allows for the automatic annotation of movement in video files of sign language (Karppa et al. 2012). It would be possible and instructive to use this application in future to recode the data in this project.

4.3 Syntactic marking of focus

As discussed in section 2.3, focus interacts with syntax in many languages of the world. This section discusses whether the same is true for RSL and in NGT. We discuss fronting (section 4.3.1), the order of the verb and the object (section 4.3.2), doubling (section 4.3.3), focus particles (section 4.3.4), and ellipsis (section 4.3.5). Section 4.3.6 summarizes the results.

4.3.1 Fronting

As discussed in section 2.3.1, focus in some sign languages can be marked by fronting, that is, by placing the focused constituent in the sentence-initial position. This syntactic strategy can be applied to different types of focus.

In this study, we found only one instance of fronting of the focused constituent in NGT (4a) and again only one in RSL (4b) – in both cases, the object is topicalized. Notice that in both examples, the focused object is not marked by eyebrow raise, and also that both examples concern corrective focus.

- (4) a. [ICE.CREAM]_{FOC} WOMAN EAT [NGTf-31-f1⁴²]
 ‘No, the woman eats ice-cream.’ (corrective)
 b. [K-O-N-F⁴³ COVER]_{FOC} BOY EAT [RSLf-30-28]
 ‘No, [the boy] eats candy.’ (corrective)

As described in chapter 3, the sentence-initial position is reserved for different types of topical information in both sign languages. The examples in (4) suggest that focused objects can move to the sentence-initial position as well. However, the number of sentences with potential fronting of focused constituents is extremely small. Also, it is not clear whether fronting is indeed used as a marker of focus, because the OSV word order might have been the result of other factors. Since the questions to the signers were pre-recorded, and the signers had to repeat the questions before answering, they could have acted as primes, influencing the word order in the answers. The design of this study is therefore probably not well suited to establish whether fronting for focus is really used. On the other hand, in section 4.3.4, we show that doubling is used to a considerable degree in answers, even though it was not used in questions, which indicates that the data does reflect the syntactic strategies of expressing focus to some extent. Further research in this domain is thus needed.

4.3.2 VO vs. OV

Another possible syntactic strategy of focus marking is the positioning of the object with respect to the verb. RSL has been reported to be an SVO language (Kimmelman 2012), while NGT is predominantly SOV, but in the Amsterdam variant also commonly SVO (Coerts 1994). Both languages in fact allow for both orders, depending on the type of verb and morphological marking on the verb, the syntactic complexity of the object, and other factors (see Kimmelman 2012). One of these factors can be IS. As shown previously, IS does influence the relative position of the verb and the object in some spoken languages (Hróarsdóttir 2001).

All elicited RSL and NGT sentences with both the object and the verb present were analyzed with respect to word order; these sentences included different types of focus as well as different syntactic scopes of focus. These data confirm previous findings, namely that both

⁴² The labelling of these examples is organized as follows: RSLf/NGTf refers to the language and to the fact that these examples come from the focus elicitation study and not from corpora of RSL and NGT. This is followed by the number of the test item (-1-), referring to the numeration provided in Appendix A1. The last number refers to the signer, as numbered in tables 4.1 and 4.2. In the case of RSL, signers partially overlap with the signers who participated in the creation of the corpora used in chapters 3, 5, and 6. In the case of NGT, there is no overlap between the signers of this study and those who participated in the corpus; to emphasize this fact, the numbers referring to NGT signers in this chapter are accompanied by f: f1, f2, etc.

⁴³ Fingerspelling for the Russian word *konfety* (‘candy’).

VO and OV orders are possible in both languages. It is clear that both orders are attested in sentences with all types of focus, such as object focus (5) and focus on the verb phrase (6).

- (5) a. GIRL CARESS [DOG]_{FOC} [RSLf-12-12]
 ‘The girl is caressing the dog.’ – VO order
 b. [CANDY]_{FOC} EAT [RSLf-30-10]
 ‘He eats candy.’ – OV order
 c. KISS [FATHER]_{FOC} [NGTf-11-f4]
 ‘She kisses her father.’ – VO order
 d. IX [SMALL DOG]_{FOC} CL:HOLD [NGTf-3-f4]
 ‘He is holding a small dog.’ – OV order
- (6) a. BOY [CL:FIX BIKE]_{FOC} [RSLf-16-30]
 ‘The boy is fixing the bike.’ – VO order
 b. MAN [BABY CL:CARRY]_{FOC} [RSLf-6-12]
 ‘The man carries the baby.’ – OV order
 c. MAN CL:PUSH [BOY SMALL]_{FOC} [NGTf-22-f3]
 ‘The man pushed a small boy.’
 d. BOY [BIKE CL:WORK.ON]_{FOC} [NGTf-21-f2]
 ‘The boy is working on the bike.’ – OV order

As we discussed in section 4.2.4.2, it is useful to compare the position of the object in three conditions:

1. Object focus – the object is the focus
2. VP and sentence focus – the object is a part of focus
3. Other cases (subject and verb focus) – the object is not in focus

Table 4.6 summarizes the RSL and NGT data for these three conditions. The table shows that both orders are used in both languages in all conditions, although RSL uses the VO order more than NGT. For both RSL and NGT, focus scopes do not differ significantly with respect to the VO vs. OV distinction (for RSL $\chi^2=0.1586$, $df=2$, $p=0.9238$; for NGT $\chi^2=0.3372$, $df=2$, $p=0.8449$). Therefore, we conclude that the VO vs. OV distinction is not an indicator of focus.

Table 4.6. VO and OV order in RSL and NGT across different focus scopes. The differences between focus scopes with respect to word order are not significant in either language.

Focus scope	RSL		NGT	
	OV	VO	OV	VO
Object	10	24	13	12
VP and sentence	7	14	10	9
Subject and verb	15	30	16	19

Note again that the word order in answers might have been primed by the word order in the questions. Further research is necessary to find out whether the VO vs. OV order in RSL and NGT is influenced by focus. On the other hand, as remarked in the previous section, doubling is used as a syntactic strategy of marking focus, despite the fact that questions did not contain such structures (section 4.3.3).

These findings suggest that verbal doubling in RSL and NGT is indeed related to focus, because the constituent that is doubled constitutes (a part of) the focus. However, doubling does not mark focus per se, as it has the additional function of foregrounding some part of the focus (see further discussion in section 5.5).

Finally, in RSL there are some cases of object focus where the verb is also doubled (9). It is not clear what the function of doubling is in this type of example. As already mentioned, in chapter 5, we will offer a unified account of doubling in RSL and NGT suggesting that the main function of doubling is to mark foregrounding of important information. However, examples like (9) do not fit this pattern. It might be the case that in RSL, verbal doubling – as it is the most commonly used type – is more grammaticalized than other types of doubling and that it acquired some grammatical function devoid of the pragmatic function proposed in chapter 5 (see further discussion of grammaticalization of doubling in section 5.5). Unfortunately, we were not able to identify this function.

- (9) KISS [FATHER]_{FOC} KISS [RSLf-11-1]
 ‘She is kissing her father.’

Although verbal doubling is the most common pattern, we also found one example of subject doubling in both languages (10a,b) and one example of object doubling in RSL (10c). Example (10a) can be explained by the analysis of doubling to be proposed in chapter 5. Note that this example is an answer to the question “What is the girl playing with: a cat or canary?”. Although we expected subject focus, the verb in fact is part of the new information as well, but it is not an answer to the question, so the subject is doubled in order to foreground the part of the focus directly answering the question.

- (10) a. [CANARY CL:SIT CANARY]_{FOC} [NGTf-12-f2]
 ‘A canary is sitting there.’
 b. [IX CAT]_{FOC} EAT [CAT]_{FOC} [RSLf-32-10]
 ‘No, the cat eats.’
 c. [DOG]_{FOC} MAN CL:HOLD [DOG]_{FOC} [RSLf-3-13]
 ‘The man is holding a dog.’

However, the examples in (10b,c) present a problem for the analysis of doubling proposed in chapter 5, because the information between the doubled constituents here is not new information, so no doubling is expected. Given the very small number of examples of this type, no further analysis is possible at the moment.

In addition, another pattern of doubling, which can be schematized as X X’, has been connected to focus in previous research (Crasborn and van der Kooij 2013). In particular, Crasborn and van der Kooij argued that in NGT, sequences of semantically related verbs are used to express verb focus. We also found such examples, both for RSL (29 cases) and NGT (23 cases) (11).

- (11) a. GIRL [CL:SIT.ON RIDE]_{FOC} [RSLf-39-1]
 ‘No, the girl rides it (bike).’
 b. BOY IX [BIKE WORK CL:FIX]_{FOC} [NGTf-21-f6]
 ‘The boy is fixing the bike.’

Crasborn and van der Kooij also showed that nouns referring to humans are often followed by a clitic PERSON to mark information focus in NGT. In the current study, this finding is confirmed for NGT (12a). This phenomenon can be construed as a manifestation of the same

X X' pattern applied to nouns, since, as (12b) shows, different nouns can participate in this construction, not only the sign PERSON. We found only one RSL sentence showing this pattern (12b).

- (12) a. [WOMAN PERSON IX]_{FOC} [NGTf-9-f4]
 'The woman (builds the house).'
- b. [IX CANARY BIRD]_{FOC} [NGTf-12-f1]
 '(She plays with) the canary.'
- c. [KISS1 KISS2 BOY PERSON]_{FOC} [RSLf-11-1]
 'She kisses the boy.'

There is considerable evidence that such sequences of semantically related verbs in RSL and NGT, as well as the combination of semantically related nouns in NGT, also occur in non-focus. Examples like (13), where the V V' or the N N' pattern are used in the non-focused part of the sentence, clearly demonstrate that the X X' pattern should not be analyzed as an unambiguous marker of focus. In (13a,b) the focus is on the subject, but the sentence contains sequences of verbs SIT SLEEP and LIE SLEEP. In (13c) the subject WOMAN is accompanied by the sign PERSON, but the focus is on the verb TAKE.PICTURE rather than on the subject. Further research is needed to scrutinize whether this pattern is more likely to appear in focus than in other contexts.⁴⁵

- (13) a. [DOG IX]_{FOC} CL:SIT SLEEP [RSLf-17-10]
 'A dog is sleeping.'
- b. [DOG]_{FOC} CL:LIE SLEEP [NGTf-17-f3]
 'A dog is sleeping.'
- c. WOMAN PERSON [CL:TAKE.PICTURE]_{FOC} [NGTf-36-f4]
 'The woman takes pictures (of the flowers).'

4.3.4 Focus particles

In many spoken and some sign languages, focus particles are used to mark some types of focus or to express some meaning connected to focus (section 2.3). This study was not designed to elicit any specific focus particles, such as ONLY or ALSO in RSL or NGT. However, it was possible that some particles would be used anyway.

The RSL data does not contain any focus particles. However, in the NGT data, the focus particle SELF was used three times. This sign has been previously described in de Clerck and van der Kooij (2005), Kimmelman (2009), and Crasborn and van der Kooij (2013). As argued by de Clerck and van der Kooij (2005), this sign is an intensifier, similar to the Dutch pronoun *zelf*. As argued in Kimmelman (2009), SELF also can be used as a reflexive pronoun. Crasborn and van der Kooij (2013) mention that it can be used as a focus particle. The current study confirms the latter finding. In the data, this particle has been used three times: two times with information focus on the object (14a,b), and once with selective focus on the object (14b). Note that all three sentences were produced by the same signer.

- (14) a. [IX SELF BOY/ NEAR CL:SIT]_{FOC} / WHISPER [NGTf-29-f3]
 'She is whispering to the boy who sits near her.' (Information focus)

⁴⁵ Such research would be complicated by the fact that non-focused nouns and verbs are likely to be elided; therefore, it is not acceptable to directly compare the number of such sequences in focus and not in focus in our data. Only if the signers had been asked to answer with full sentences, such a comparison would be possible.

- b. [SELF CLEAR DOG SMALL]_{FOC} CL:HOLD [NGTf-3-f3]
 ‘He is clearly holding a small dog.’ (Information focus)
- c. [SELF IX WOMAN PERSON]_{FOC} CL:SAW [NGTf-9-f3]
 ‘A woman is sawing [a plank].’ (Selective focus)

These examples suggest that SELF is used to mark focus, without having either the reflexive or intensifier readings. SELF in this function is similar to the Dutch adverbial *zelfs* ‘even’. Note, however, that *zelfs* in Dutch, as well as *even* in English, are both used for emphatic focus. This might also be the case in sentence (14b), where the presence of the adverbial CLEAR also reflects some emphasis. However, in the other two sentences an emphatic interpretation is unlikely. Future research may indicate whether the particle SELF marks focus in general in NGT.

4.3.5 Ellipsis

Previous research revealed that sign languages, including RSL and NGT (section 3.4), allow for ellipsis of constituents (Jantunen 2013). It is therefore interesting to investigate how ellipsis interacts with focus, in particular, whether all types of constituents that are not in focus can be elided and whether different types of focus differ with respect to ellipsis.

As discussed in section 4.2.4.2, we decided not to look at ellipsis per se, but to classify sentences into focus-only vs. not focus-only. In both languages, non-focused parts of answers can be elided (15a,b), but there are also cases of full answers in both languages (15c,d).

- (15) a. [IX GIRL IX]_{FOC} [RSLf-1-1]
 ‘The girl [is hitting the boy].’
- b. [DOG]_{FOC} [NGTf-3-f1]
 ‘[The man is holding] a dog.’
- c. WOMAN [JUMP]_{FOC} [RSLf-37-10]
 ‘The woman is jumping.’
- d. MAN PERSON IX [CHILD CL:CARRY]_{FOC} [NGTf-6-f1]
 ‘The man is carrying a child.’

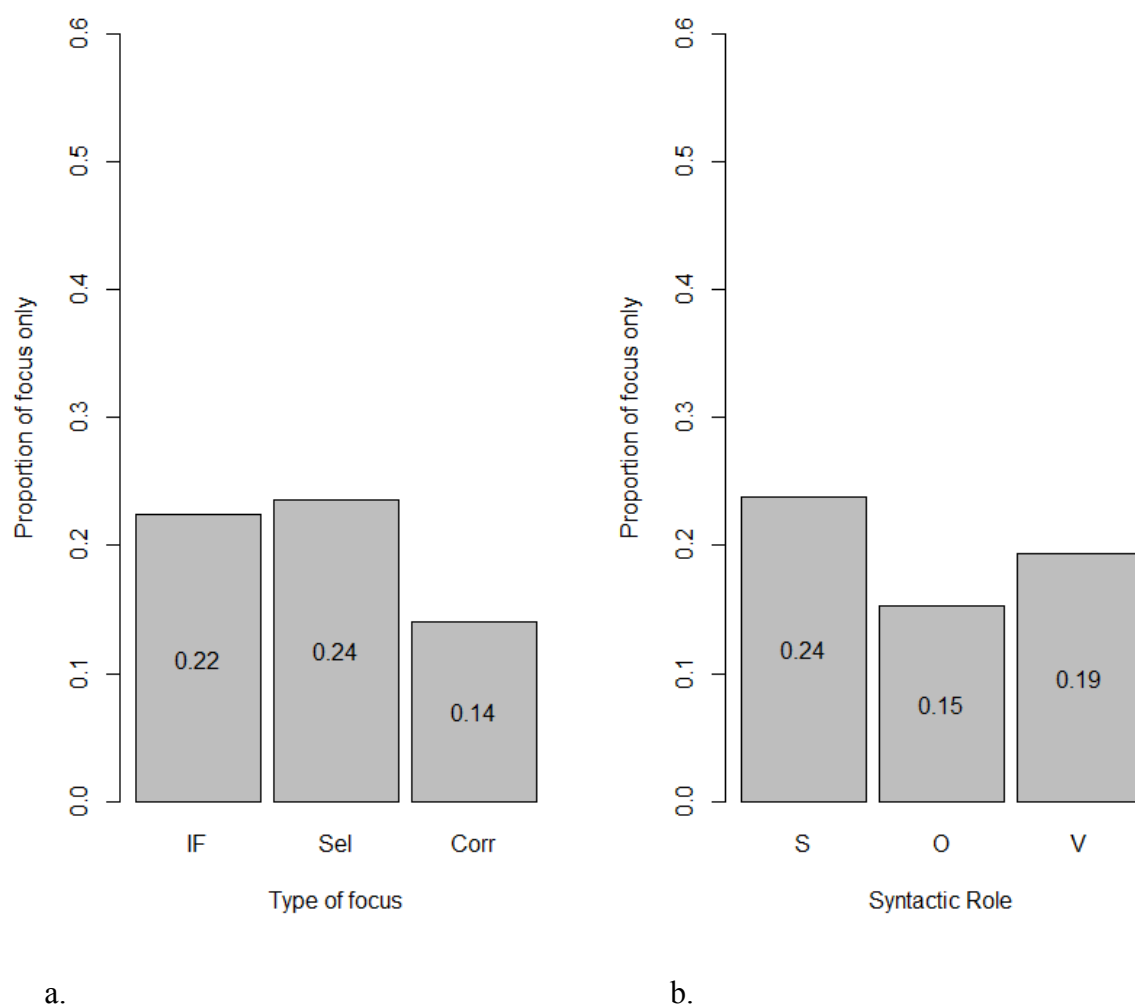


Figure 4.5. Proportion of focus-only sentences across types of focus (a) and syntactic roles (b) in RSL. The differences are not significant. IF – information focus; Sel – selective focus; Corr – corrective focus.

In RSL, ellipsis turned out not to be very common, that is, most of the sentences contained not only the focused signs, but also some non-focused signs. As for the frequency of ellipsis, no differences were found between types of focus and syntactic roles (logistic regression model shows a weak non-significant correlation between these factors and ellipsis: $R^2=0.031$; $G=4.16$; $df=4$; $p=0.3853$ ⁴⁶); see figure 4.5.

⁴⁶ Here and in the following, results of fitting a logistic regression model are reported. Such results cannot be interpreted straightforwardly, so some instruction is necessary. First, it is always most useful to look at the graphical representation which is provided when significant differences are found. The fact that a significant correlation is found means that the differences evident on the graphics are unlikely to have occurred by chance (but see the next footnote for more detail). Second, this analysis models whether the behavior of a binary variable (in this particular case, whether the sentence is focus-only or not focus-only) is correlated with one or more factors (in this case, focus type). The fact that a correlation is significant means that there is a significant input of the factor in the variation of the dependent variable. In other words, the model tells us: if you encounter a new sentence, look whether it is information, selective, or corrective focus, and if it is corrective, lower its chances of it being focus only. The remark that the correlation is weak reflects the fact that in all types of focus, there are sentences which are focus-only or not, so the fact that we know the type of focus in a new sentence does not mean that we will automatically know whether it will be focus-only or not. If in our data all sentences with corrective focus were not focus-only, then the correlation would be very high. Here and further on in the text, we report significance, effect size, and other measures for the overall model (which reflects whether and how strong the factors predict the dependent variable), while the asterisks on the graphics reflect the significant

In NGT, on the other hand, ellipsis of the non-focused constituents was quite common (figure 4.6). The different types of syntactic roles in focus (subjects, objects and verbs) were not related to any differences. However, for focus type, corrective focus licenses ellipsis significantly less often than the other two types of focus (logistic regression model shows a weak but significant correlation between type of focus and ellipsis: $R^2=0.064$; $G=10.72$; $df=2$; $p=0.0047$).

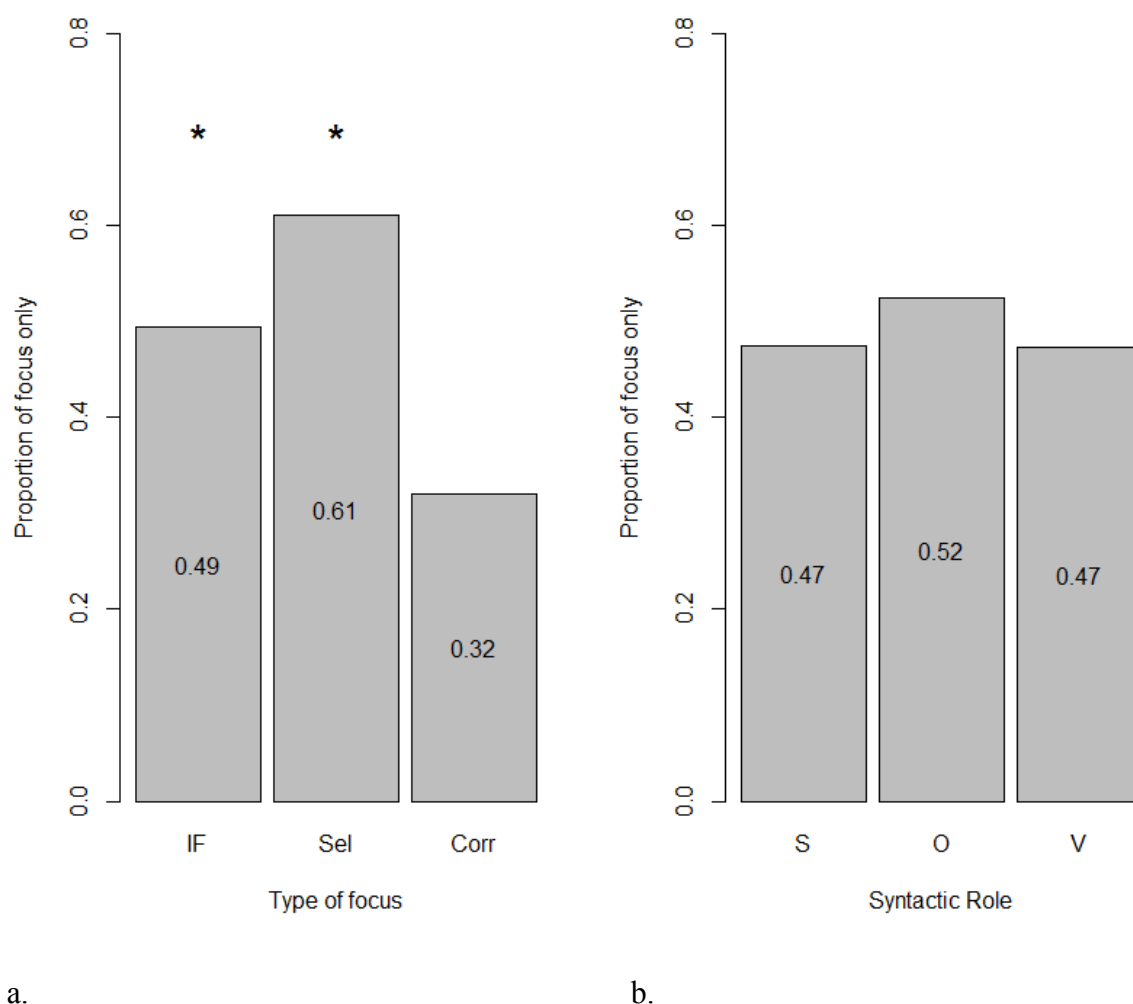


Figure 4.6. Proportion of focus-only sentences across focus types (a) and syntactic roles (b) in NGT. The difference between corrective and the other two types of focus is significant.⁴⁷ IF – information focus; Sel – selective focus; Corr – corrective focus.

input of separate levels of variables (see also the footnote going with figure 4.6). Further discussion of this type of modelling and the interpretations of the results are discussed in Gries (2009).

⁴⁷ Strictly speaking, the logistic regression modelling does not tell us the significance of the differences between sentences with different types of focus; instead, it gives the level of significance of the input of each of the levels of the factor. In other words, imagine that we want to predict whether a new sentence will be focus-only or not. For information and selective focus, we can do the following: we take the average chance of a sentence to be focus-only (in this case, 49%), and use it as an assessment. However, if we encounter a sentence with corrective focus, we will score significantly better if we lower the probability of this new sentence being focus-only. This is why the asterisks for significance levels are placed not between the bars, but on top of them. However, for the sake of simplicity, in the following, we will stick to formulating the results in terms of significant differences between groups, but they should be interpreted in the way described here.

If we compare the frequency of ellipsis in RSL and NGT directly, it turns out that in RSL, 20% (42 out of 210) of the sentences contained only focused information, compared to 49% in NGT (107 out of 217). This difference is statistically significant ($\chi^2=40.3525$, $df=1$, $p<0.0001$), and the effect size is moderate (Cramer's $V\approx 0.3$).

The finding that RSL and NGT differ in the applicability of ellipsis to non-focused information is important. No previous study has compared ellipsis across sign languages. It is generally simply claimed that sign languages use a great deal of ellipsis. Although this is true for RSL and NGT, the extent to which they use this strategy for (indirect) focus marking is clearly different. It is possible that this difference is not due to a systematic language difference. It might, for example, have been the case that the RSL signers were in general less comfortable with filming and as a result used a more formal register, thereby producing fewer elliptical constructions. However, there are no obvious indications that this was the case.

Finally, as pointed out in section 4.2.1, the NGT signers are a heterogeneous group, as, strictly speaking, they are not all native signers. In order to test whether this had any effect, we compared the groups of native and non-native signers. Since above, we have shown that type of focus plays a role in predicting ellipsis in NGT, we applied binary logistic regression to test two factors, namely type of focus and nativeness of the signer, and their interactions as predictors of ellipsis. In this model, we confirmed the previous finding that type of focus is a significant predictor of ellipsis. However, it turned out that the difference between the group of native and non-native signers is not significant ($p=0.9730$). Therefore, the heterogeneity of the group of NGT signers does not appear to have played a major role in the results discussed here.

4.3.6 Summary

For syntactic marking of focus in RSL and NGT, research questions QF1, QF2, and QF4 have been addressed, that is, the question of how focus is marked, and the questions addressing the differences between different focus types, and between RSL and NGT.

Syntactic marking is used to mark focus in RSL and NGT but in a limited way. First, focus is related to ellipsis, in the sense that only non-focused parts of sentences can be elided (which is the expected pattern), but there are differences in frequency between RSL and NGT: in NGT ellipsis is more frequent than in RSL. In addition, in NGT different types of focus differ with respect to ellipsis: corrective focus is more restrictive in this respect than the other two types.

Some markers of focus described for other sign languages have not been found in the RSL and NGT data analyzed here. In particular, this concerns fronting (which is attested in two sentences only) and the difference between VO and OV orders (which does not interact with focus). Remember that the data elicitation was not designed to study such syntactic markers, as the answers may have been primed by the questions.

On the other hand, doubling – another common phenomenon – is present in RSL and NGT. In particular, verbs are doubled in VP and verb focus in both languages; in addition, in RSL verbs are doubled under sentence focus and object focus. Another related phenomenon – sequences of semantically related verbs and nouns – is also present in both languages; however, this strategy is attested both in focus and out of focus, and can therefore not be considered a dedicated focus marking strategy.

Finally, we have found some instances of the focus particle SELF in NGT, which is probably used to mark emphatic focus, but which sometimes also occurs in non-emphatic contexts to mark focus in general.

4.4 Manual prosodic markers of focus

As mentioned in section 4.2.4.3, the manual prosodic markers will be studied with respect to length (section 4.4.1), number of repetitions (section 4.4.2), speed (section 4.4.3), size (section 4.4.4), and height (section 4.4.5). The markers are discussed from the most to the least commonly used. For the reasons described in section 4.2.4.3, quantitative analysis was only applied to subject, object and verb focus, resulting in 149 signs for RSL and 188 for NGT for the analysis (for some markers, one or two more cases were unclear so they were also excluded from the analysis). Additionally, we discuss VP and sentence focus separately in section 4.4.6, and summarize the results in section 4.4.7.

4.4.1 Length

As discussed in section 4.2.4.3, we compared the signs in focus to their non-focused counterparts with respect to length. The comparison revealed that focused signs are often longer in both RSL and NGT, that is 64% of the cases in RSL (96 out of 149) and in 63% of the cases in NGT (119 out of 188).⁴⁸

In both languages, all types of focus (information, selective and corrective), all syntactic scopes of focus (subject, object and verb), and focused signs of all movement types can be marked by length. However, the two sign languages differ with respect to the prominence of length as a focus marker in different contexts. In RSL, no differences were found between focus types, syntactic roles, or movement types. A logistic regression model shows that the correlation between these predictors and the frequency of length marking is very weak and not significant ($R^2=0.08$; $G=8.94$; $df=6$; $p=0.1768$). In contrast, in NGT some differences in using length as a focus marker were found (figure 4.7). Applying the procedure described in section 4.2.4.3, we found that focus type and movement type are significant predictors of length marking (logistic regression model shows a low but highly significant correlation: $R^2=0.164$; $G=24.06$; $df=4$; $p<0.0001$). In particular, selective and corrective focus are marked by length less frequently than information focus, and signs with hand-internal and small path movement are marked less frequently than signs with normal path movement. On the other hand, there are no differences between subject, object or verb focus marking.

⁴⁸ Focused signs are shorter than their counterparts in only 7% of cases in NGT and 11% of cases in RSL. Therefore, as explained in section 4.2.4.3, we argue that these cases can be collapsed with the cases in which focused and non-focused signs are of the same length.

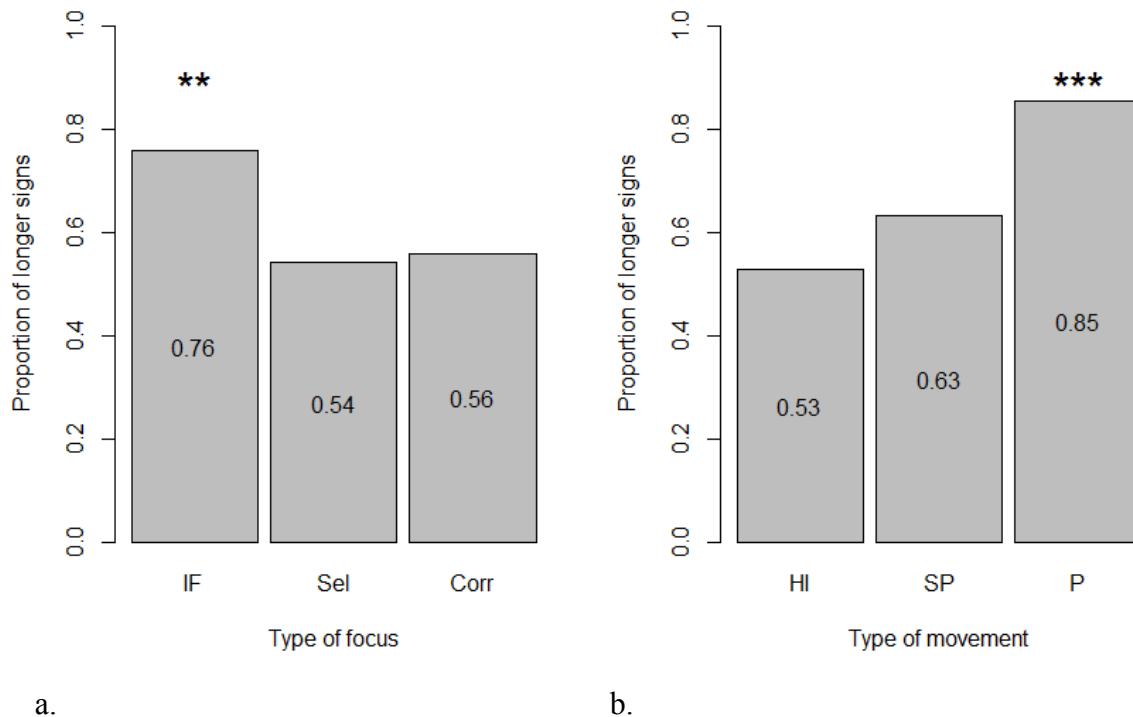


Figure 4.7. a) Proportions of signs which are longer in focus across focus types in NGT. Difference between IF and (Sel and Corr) is significant. b) Proportions of signs which are longer in focus across types of movement in NGT. Difference between (HI and SP) and P is significant. IF – information focus; Sel – selective focus; Corr – corrective focus. HI – hand internal; SP – small path; P – normal path.

The fact that information focus in NGT is marked by length more than the other two types of focus is surprising, given that typologically, information focus tends to be less marked than contrastive focus (Zimmermann and Onea 2011). However, a possible explanation lies in the elicitation procedure. In the case of selective focus, the signer was offered alternatives in the question (“Who is walking: a boy or a girl?”), so the answer *boy* was given information (not new). In the case of corrective focus, since most of the pictures involved men and women (“The woman takes a picture of another woman, right? No, it’s a man”), the answer was not given but implied. It might therefore be the case that NGT has a rule requiring given information to be de-accented. This rule clashes with the focus marking rule, which leads to the less prominent marking of corrective and selective foci. Notice that RSL does not show the same phenomenon with respect to length marking (but see section 4.4.4 below). The difference between marking information focus on the one hand and selective and corrective focus on the other hand is not large. We may therefore conclude that all types of focus are marked by length.

The reason why focused signs with a hand-internal and small path movement in NGT are marked less frequently by length can be connected to other prosodic markers. As we will show below, such signs are also less frequently marked by size and speed (sections 4.4.3-4). As remarked above, the length of a sign is dependent on the size and speed of the movement. In addition, in NGT, repetition in general is used less often to mark focus (section 4.4.2). This means that the relative influence of size on the length marking is greater in NGT, which might explain why signs with a hand-internal movement are significantly less marked by length in this language.

4.4.2 Repetition

As discussed in section 4.2.4.3, we compared the signs in focus to their non-focused counterparts with respect to the number of repetitions. The results indicate that repetition is used quite frequently to mark focus in both RSL and NGT. In RSL, 44% (65 out of 149) of the focused signs contain more repetitions than their unfocused counterpart, and in NGT, 36% (68 out of 187).⁴⁹ The overall difference between the languages is not significant ($\chi^2=1.8279$, $df=1$, $p=0.1764$). However, the languages do differ in their patterns of marking across focus types, syntactic roles, and movement types.

In RSL, different focus types and syntactic roles are equally marked by repetition. However, signs with a normal path movement are never marked by repetition, while signs with a hand-internal or small path movement often are (logistic regression model shows a highly significant correlation between the type of movement and the frequency of repetition marking: $R^2=0.247$; $G=30.39$; $df=2$; $p<0.0001$). Figure 4.8 shows the difference in repetition marking across movement types.

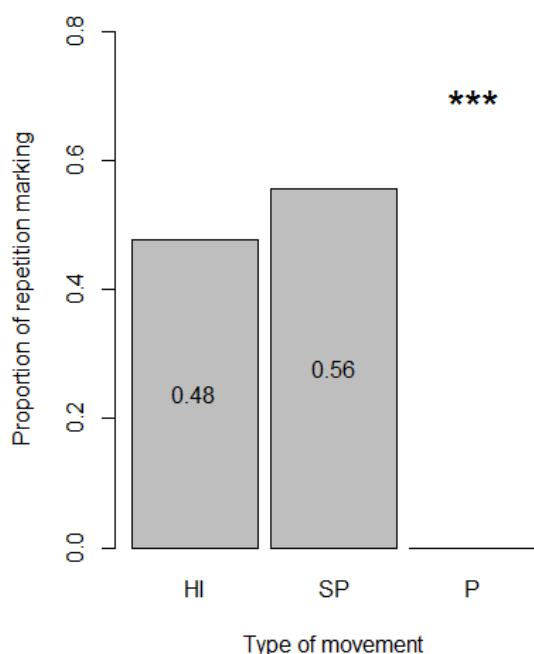


Figure 4.8. Proportions of signs with more repetitions when focused compared to non-focused versions of the same signs across movement types in RSL, the difference between P and (HI and SP) is highly significant. HI – hand internal; SP – small path; P – normal path.

In contrast, in NGT, movement types do not show any differences with respect to number of repetitions, and – similar to RSL – neither do focus types or syntactic roles (logistic regression model shows a very weak and non-significant correlation between these three factors and marking by repetition: $R^2=0.054$; $G=7.46$; $df=6$; $p=0.2804$).

To sum up, RSL and NGT behave differently with respect to the interaction of focus marking and focus type, syntactic role, and movement type in the use of repetition as a focus

⁴⁹ Focused signs contain less repetitions than their counterparts in only 4% of cases in NGT and 5% of cases in RSL. Therefore, as explained in section 4.2.4.3, we argue that these cases can be collapsed with the cases when focused and non-focused signs are the same with respect to repetitions.

marker, since only RSL shows a significant effect, namely a normal path movement being incompatible with repetition as a marker of focus.

Because repetition is more restricted in its use in RSL, it is not appropriate to compare frequency of use directly. In order to make a more valid comparison, we can exclude signs with a normal path movement and only include signs with a hand-internal or small path movement in both languages. This leaves for RSL 65 signs with repetitions out of 126 (52%), and for NGT 54 signs out of 139 (39%). The difference is statistically significant ($\chi^2=4.3347$, $df=1$, $p=0.03734$), but the effect size is small (Cramer's $V \approx 0.13$).

There are different possible explanations for why normal path movement is not compatible with repetition as a marker in RSL, while in NGT all types of movement can be marked in this way. One theory is that the difference indeed reflects an RSL-specific phonological restriction: signs with (large) path movement cannot be repeated. On the other hand, it might be a quirk of the small selection of signs used in this study. We therefore decided to also look at signs individually to find out whether they are ever marked by repetition.

Both in RSL and in NGT, there are some items that are never marked by repetition (table 4.7). In RSL all the signs⁵⁰ with a normal path movement used in this study behave in this way, but note that for instance CLOSE.EYES is also never marked by a repetition in RSL, although it contains hand-internal movement. Clearly, some signs have lexical restrictions on the applicability of repetition (as a marker of focus, or in general). It might be the case that signs with a normal path movement are more likely to have such restrictions in RSL. Further research is needed to pin down those factors. Also, future experiments on focus marking in RSL and NGT should take this fact into account and check in advance whether the signs used in research could be marked by repetition in principle.

Table 4.7. Individual signs (in focus) never marked by repetition in RSL and NGT.

NGT		RSL	
<i>Sign</i>	<i>Type of movement</i>	<i>Sign</i>	<i>Type of movement</i>
CAT	P	CLOSE.EYES	HI
CLOSE.EYES	HI	FATHER	SP
FATHER	SP	SIT.ON	P
GIRL	P	SOUP	P
MAN	HI	THROW	P
THROW	P		

⁵⁰ There are only three such signs in the RSL data because some of the signs which were originally classified as containing a normal path movement, were later classified as containing a small path movement.

4.4.3 Speed

We also compared the signs in focus to their non-focused counterparts with respect to speed. In both languages focused signs are sometimes slower than their non-focused counterparts. In RSL, this was found in 20% (30 out of 149), and in NGT, in 22% (42 out of 188) of focused signs. Focused signs are faster than their counterparts in only 5% of cases in NGT and 10% of cases in RSL. For RSL the percentage of focused signs which are faster is relatively high, considering that in only 20% of cases focused signs are longer. It might be the case that speed is a less reliable marker of focus in this language. Further research is needed for this marker, but for now, we analyze the cases when focused signs are slower than their non-focused counterparts.

In RSL, no differences can be found across different focus types, or syntactic roles or due to movement types (logistic regression model shows a weak correlation not reaching the level of statistical significance: $R^2=0.086$; $G=8.35$; $df=6$; $p=0.2135$).

A similar picture emerges for NGT with respect to focus types and syntactic roles. For movement types, however, logistic regression model shows a weak but significant correlation ($R^2=0.05$; $G=6.3$; $df=2$; $p=0.0429$) between movement type and marking by speed: signs with normal path movements are slightly more likely to be marked (figure 4.9).

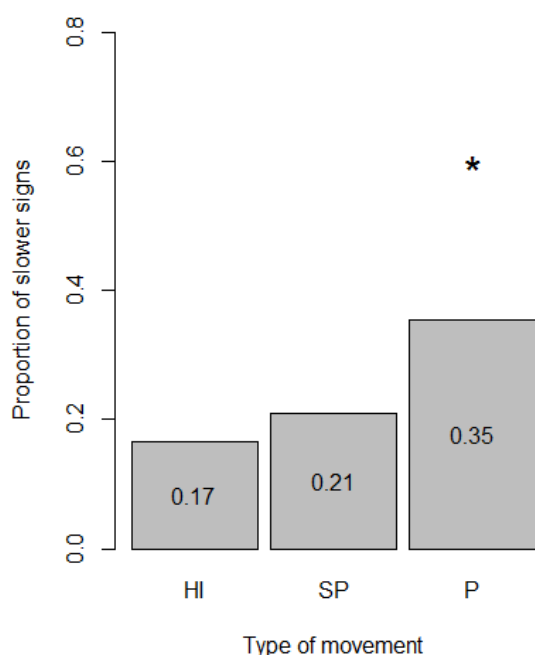


Figure 4.9. Proportion of signs which are slower in focus across types of movement in NGT. Difference between P and other types is significant. HI – hand internal; P – normal path; SP – small path.

4.4.4 Size

Some focused signs are larger than their non-focused counterparts. This strategy of focus marking is also not very common: in RSL, only 14% (21 out of 149) of the signs are marked by increased size size, while in NGT, the same holds for 27% (50 out of 188) of the signs.⁵¹

⁵¹ Focused signs are smaller than their counterparts in only 4% of cases in NGT and 6% of cases in RSL. For RSL the percentage of focused signs which are smaller is relatively high, considering that in only 14% of cases focused signs are longer. It might be the case that size is a less reliable marker of focus in this language.

The difference between the two languages is significant ($\chi^2=7.81223$, $df=1$, $p=0.005189$). Note, however, that the effect size is rather small (Cramer's $V \approx 0.15$). Below we show that size interacts differently with focus types and movement types in RSL and NGT, and as focus types and movement types are not equally represented in the two languages, this inequality may result in the overall differences in frequency of this marker.

In RSL there are significant differences between focus types and between types of movement (logistic regression model shows a moderate highly-significant correlation between the size and these two factors: $R^2=0.348$; $G=32.09$; $df=4$; $p<0.0001$). In particular, corrective and selective foci are less likely to be marked by increased size than information focus, and normal path movement is marked by a larger size much more often than other types of movement (see figure 4.10).

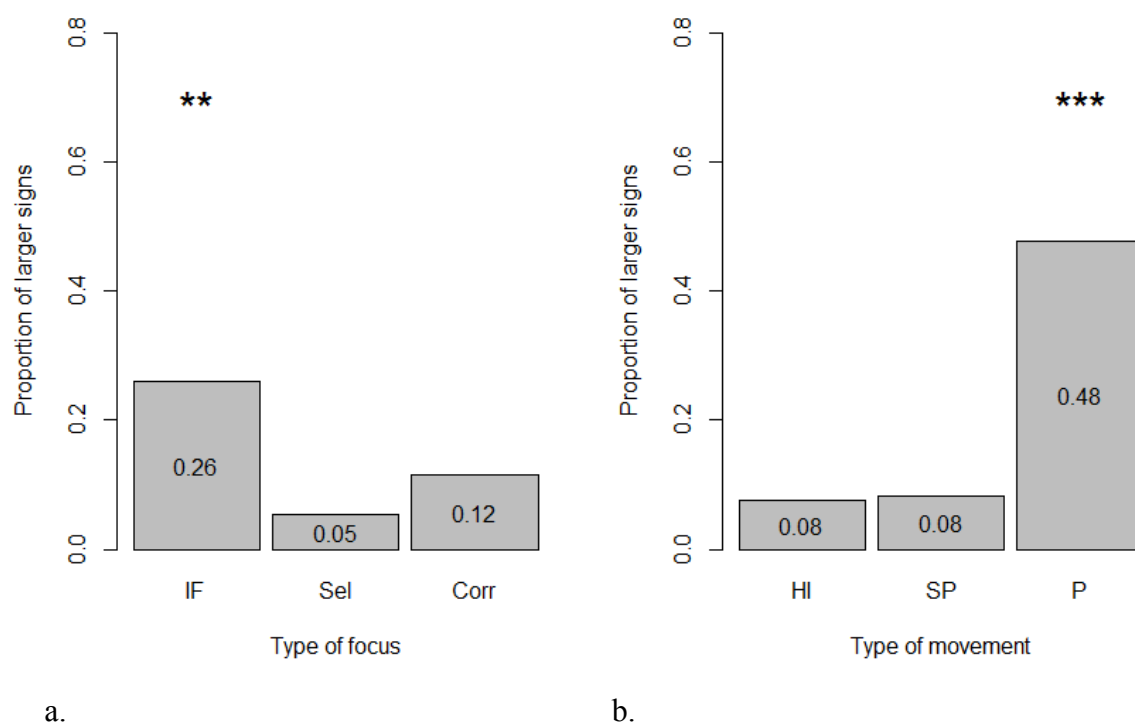


Figure 4.10. a) Size marking across focus types in RSL. Differences between IF and (Sel and Corr) are significant. b) Size marking across types of movement in RSL. Differences between P and (SP and HI) are significant. IF – information focus; Sel – selective focus; Corr – corrective focus. HI – hand-internal; P – path; SP – small path.

In contrast, in NGT, only types of movement are significantly different from each other, while focus types and syntactic roles are equally marked by a larger size (logistic regression model shows a moderate highly significant correlation between size and type of movement, $R^2=0.311$; $G=45.06$; $df=2$; $p<0.0001$). In particular, small path movements are much more likely to be marked by a larger size than hand-internal movements, and normal path movement is the movement type that is most likely to be marked in this way (figure 4.11).

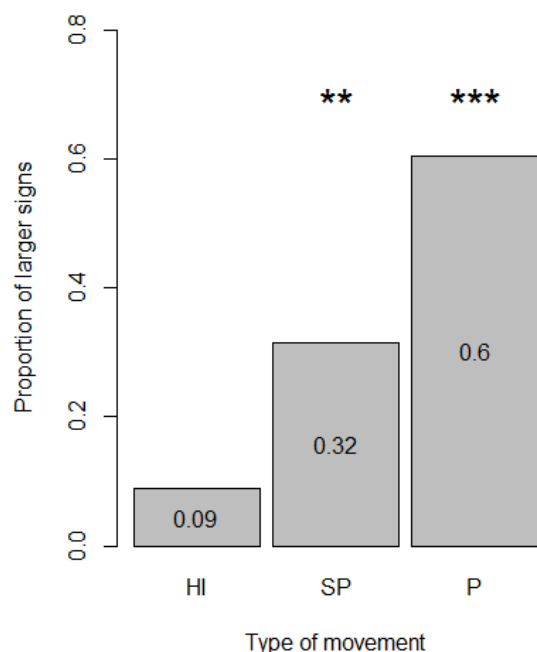


Figure 4.11. Proportions of signs which are larger when in focus across movement types in NGT. All differences are significant. HI – hand-internal; P – path; SP – small path.

The fact that movement type influences size as a focus marker is not unexpected. As already pointed out in section 4.2.4.1, hand-internal movements cannot be easily modified in size and consequently, these are not usually modified in this way in either RSL or NGT. In both languages, there are nevertheless some examples of focused signs with a hand-internal movement which are larger than their unfocused counterparts. This is due to the fact that a hand-internal movement, although it cannot easily be made larger, can be reduced, so in the non-focus position, signs with such a movement are sometimes articulated with a very small movement (figure 4.12).

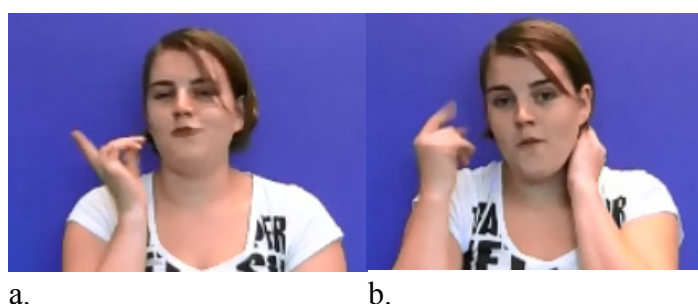


Figure 4.12. NGT sign WOMAN marked by larger size of movement in focus in comparison to the non-focused counterpart. a) The first frame of the sign in focus. b) The first frame of the sign not in focus. The movement in both versions consists of the index finger touching the thumb.

On the other hand, normal path movements in both languages are quite likely to be increased in size to mark focus, because they can easily be made larger. Finally, note that signs with a small path movement in RSL pattern with signs with a hand-internal movement – they are both unlikely to be marked by an increase in size, while in NGT all three groups of signs differ from each other: signs with hand-internal movements are less likely to be marked in this

way than signs with small path movements, and the latter are less likely to be marked than signs with normal path movements.

4.4.5 Height

Some focused signs are placed higher in the signing space than their non-focused counterparts.⁵² In RSL, this has happened in 10% (15 out of 149) of cases, and in NGT, in 16.5% (31 out of 188).⁵³ The difference in frequency of this marker between languages is not significant ($\chi^2=2.9087$, $df=1$, $p=0.0881$, Cramer's $V\approx0.09$). Note again that a direct comparison between RSL and NGT might not be valid because of the different influence of focus type and movement type on height marking in these languages, as will be detailed below.

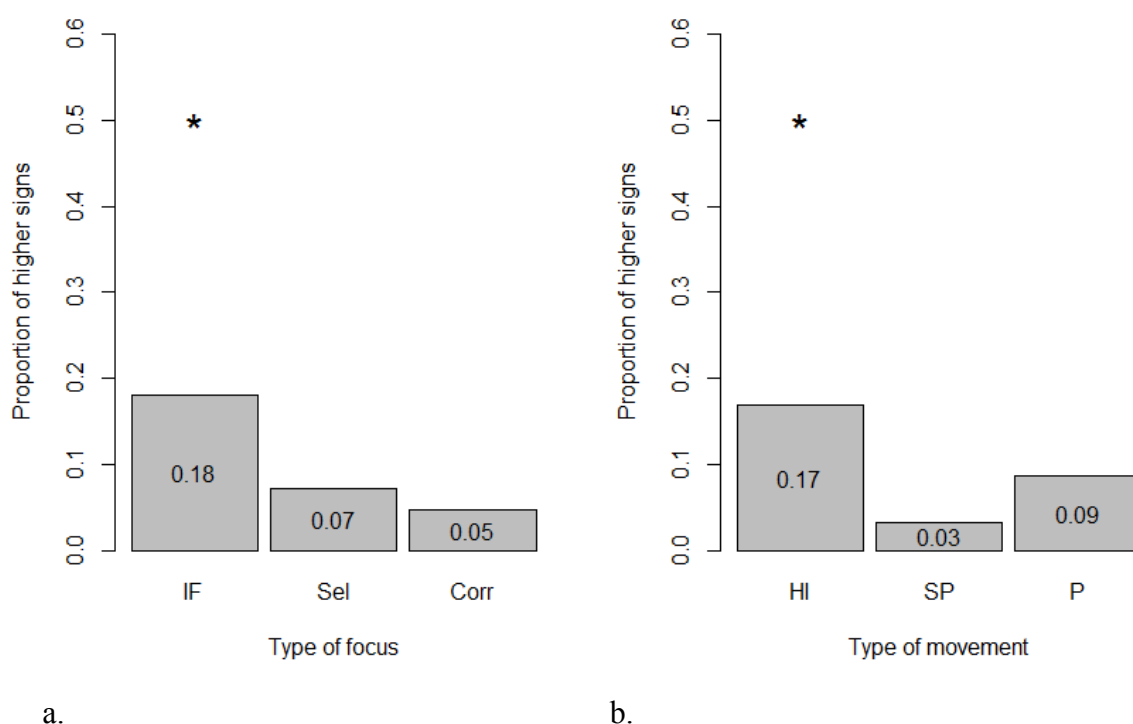


Figure 4.13. a) Marking by higher location across types of focus in RSL. Difference between IF and (Sel and Corr) is significant. b) Marking by higher location across types of movement in RSL. Differences between HI and (SP and P) are significant. IF – information focus; Sel – selective focus; Corr – corrective focus. HI – hand-internal; P – path; SP – small path.

In RSL, there is a significant difference between types of focus and types of movement with respect to this type of marking (logistic regression model shows a weak but significant correlations: $R^2=0.179$; $G=13.4$; $df=4$; $p=0.0095$). In particular, information focus is marked more often than the other two types, and signs with a hand-internal movement are marked

⁵² It might be the case that the marker of focus is not a higher location, but a location further away from the neutral space. However, we did not have any test items with the lexical location below the neutral space, so it was not possible to see whether such signs would be made higher or actually lower when in focus.

⁵³ Focused signs are lower than their counterparts in only 4% of cases in NGT and 3% of cases in RSL. Therefore, as explained in section 4.2.4.3, we argue that these cases can be collapsed with the cases when focused and non-focused signs are the same with respect to height.

more often than signs with both a small path and normal path movement (figure 4.13). In NGT, no significant differences in marking by higher location were found with respect to syntactic roles, types of focus, or types of movement.

For RSL, information focus is the most marked type of focus. This is typologically unusual since there is a cross-linguistic preference for marking contrastive focus more than non-contrastive focus. An explanation along the lines proposed in section 4.4.1 can apply here as well (it might therefore be the case that RSL also has a rule that given information has to be de-accented). Note, however, that the difference in marking between the types of focus is rather small, and in general height is not a common marker of focus in RSL (or NGT).

The fact that in RSL signs with a hand-internal movement are most likely to be marked by height is not surprising. Similar findings had already been reported for NGT (Crasborn and van der Kooij 2013). Secondly, signs with hand-internal movement are not likely to be marked by size modification, while height modification is easily applied to them. It might be the case that size and height modification are phonetic variants of the same underlying phonological feature, the application of which depends on phonological properties of the base sign. Finally, note that in RSL, small path movement patterns with normal path movement, which can probably be explained by the fact that signs with small path movement usually have body contact, which makes height modification (almost) impossible.

4.4.6 VP and sentence focus

Having established the role of various manual prosodic markers of subject, object, and verb focus, we can now turn to the question how focus is marked when it has a wider scope, that is, how VP and sentence-focus is marked. No quantitative results are presented here, as, for the reasons outlined in section 4.2.2, not enough data was collected to allow for a systematic analysis.

The evidence suggests that in both RSL and NGT focus projection is present. In VP focus, the verb is marked by manual prosodic markers, such as length, height, etc., but not the object (16a-b). The same is true for sentence-focus: in this case, too, it is only the verb that is marked (16c-d).

- | | | | |
|------|----|--|--------------|
| (16) | a. | BOY [CL:FIX BIKE] _{FOC}
'The boy is fixing the bike.' | [RSLf-21-16] |
| | b. | BOY [BIKE CL:FIX] _{FOC}
'The boy is fixing the bike.' | [NGTf-21-f4] |
| | c. | [MAN STAIRS WRONG CL:FALL] _{FOC}
'A man fell from the stairs.' | [RSLf-16-30] |
| | d. | [MAN PERSON CL:FALL] _{FOC}
'A man fell.' | [NGTf-16-f5] |

There are some apparent exceptions to the rule formulated above. In a few examples of VP-focus in RSL and NGT, the object is prosodically marked (17). However, the number of such examples is too small to draw any further conclusions.

- | | | | |
|------|----|--|---------------|
| (17) | a. | BOY IX [CL:FIX BIKE] _{FOC}
'The boy is fixing a bike.' | [RSLf-21-29] |
| | b. | [BIKE CL:FIX] _{FOC}
'(The boy) is fixing a bike.' | [NGTf-21-f10] |

In addition, in some cases in RSL, both the verb and the object are prosodically marked. However, this is most likely an artifact of the study design: in particular, some selective and corrective questions were signed with prosodic marking on both the object and the verb as well (18a), and this pattern was probably repeated in the answer (18b).

- (18) a. MAN [CL:FIX BIKE]_{FOC}, RIGHT? [RSL(question)]
 ‘The man is fixing the bike, right?’
 b. MAN [CL:PUSH GIRL]_{FOC} [RSLf-22-16]
 ‘No, the man is pushing the girl.’

Examples of this type can be interpreted as having separate contrastive foci on V and on O, not just on VP. This explains why both V and O are marked prosodically. Based on the limited data set, no differences between types of focus with respect to prosodic marking of VP or sentence focus were found. It is clear that more research on these focus domains is needed.

4.4.7 Summary

Focus is marked by several manual prosodic parameters in both RSL and NGT. Focused signs can be longer, larger, slower, and/or higher, and they may contain more repetitions than their non-focused version. In addition, we have seen that RSL and NGT differ from each other. RSL uses repetitions more frequently for focus marking than NGT, and NGT uses size modification more frequently than RSL.

One important finding is that in both RSL and NGT, different syntactic roles do not show any differences with respect to any of the focus markers. Also, it is interesting to observe that for several markers in both languages, it turned out that information focus is the most marked focus type compared to corrective and selective focus. This can be explained by taking into account the design of the study which implied that signs in selective and corrective focus were given information, and given information has to be de-accented. Still, with respect to this typologically interesting pattern, no definite conclusion can be reached in this dissertation.

As for the types of movement, a complex picture emerged. First, in RSL type of movement imposes a constraint on the number of repetitions: only signs with hand-internal and small path movement can be affected by this marker. This is not the case for NGT. Secondly, speed is a more common focus marker for signs involving a normal path movement in NGT, but not in RSL. As for size marking, both languages show a preference for applying this marker to signs with a normal path movement, but NGT also commonly uses this marker in signs with a small path movement, unlike RSL. Finally, only in RSL, the type of movement has a significant influence on height marking.

In this dissertation, we are not able to provide global explanations for the observed patterns. However, it is clear that type of movement is an important predictor of prosodic markers of focus, and that there is cross-linguistic variation in this area.

In order to find out whether the heterogeneity of the NGT group (section 4.2.1) influences the findings, native and non-native NGT signers were compared to each other according to their use of the relevant manual prosodic markers of focus (using Pearson’s Chi Squared Test and Fisher’s Exact Test for Count Data). There were no differences on any of the manual prosodic parameters (number of repetitions, length, height, movement size, and speed).

4.5 Non-manual markers of focus

This section will provide the first description of non-manual markers of focus in RSL. For NGT, our results will be compared to those obtained by Crasborn and van der Kooij (2013).

As described in section 4.2.4.4, we considered several possible non-manual markers of focus. In sections 4.5.1-6, we will discuss eyebrow raise, head tilt, body lean, head nods, mouthing, and eye gaze in both languages in turn, based on data involving subject, object and verb focus. In section 4.5.7, we will discuss whether VP and sentence focus is non-manually marked and whether the phenomenon of focus projection is observed. In section 4.5.8, we summarize our findings.

4.5.1 Eyebrow raise

As discussed in section 2.3, eyebrow raise is used as a marker of focus in several sign languages, including NGT (Crasborn and van der Kooij 2013). For an illustration of eyebrow raise in RSL and NGT, see multiple examples and figures in chapter 3.

In RSL, there are only 9 cases (out of the 183⁵⁴ sentences with subject, object or verb focus) in which the focused item is accompanied by eyebrow raise. Seven of these involve subject focus, one object focus, and one verb focus. As for the different types of focus in the subject focus cases, information focus is marked once, and corrective and selective focus three times each. Notice also that four of these nine sentences are not focus-only. The numbers are very small, so the tentative conclusion that can be drawn based on this data is that focus in RSL is hardly ever marked by eyebrow raise, and when it is, it is mostly used with contrastive focus on subjects.

In NGT, on the other hand, focus is marked by eyebrow raise in almost 20% of all cases (40 out of 202 sentences with focus on subject, object or verb; 15 of those are not focus-only sentences); the difference between RSL and NGT is significant ($\chi^2=19.1498$, $df=1$, $p<0.0001$, Cramer's $V\approx 0.22$). Since only 20% of focused signs are marked with eyebrow raise, it is clearly not a very common marker; however, eyebrow raise on the non-focused part of the sentence only has not been attested at all. A binary logistic regression applied to the NGT data does not show any significant differences between types of focus or syntactic roles ($R^2=0.037$; $G=4.73$; $df=4$; $p=0.3165$). This goes against the finding in Crasborn and van der Kooij (2013), whose data indicate that eyebrow raise more often accompanies object and verb focus (note that they did not provide any quantitative data).

Crasborn and van der Kooij (2012) also found that the whole answer in question-answer pairs in NGT is often accompanied by eyebrow raise. This pattern is also attested in our data (19a). However, it is questionable whether this can be analyzed as a focus marker, because in these cases, the eyebrow raise clearly accompanies the non-focused part of the utterance as well. In addition, such examples are also present in RSL despite the fact that RSL hardly uses eyebrow raise as a focus marker (19b). It thus seems more plausible to analyze eyebrow raise accompanying the whole sentence as a general marker of assertion in both languages, as Crasborn and van der Kooij (2013) also suggested.

- (19) a. er
 MAN [STAND BOY SMALL CL:STAND CL:PUSH]_{FOC} [NGTf-22-f5]
 'The man pushes a boy.'

⁵⁴ Recall that the numbers of sentences analyzed in different sections are not always the same, because for some sentences some of the markers were not clearly identifiable, but these sentences were still used for the analysis of other markers.

- b. $\frac{\text{er}}{\text{IX BOY [PLAY.GUITAR]}_{\text{FOC}}}$ [RSLf-14-16]
 ‘The boy plays guitar.’

4.5.2 Head tilt

Crasborn and van der Kooij (2013) showed that in NGT backward head tilt is used to mark focus on the object, and less frequently on the subject. We therefore tested whether this was also the case in our data set, for both RSL and NGT. For an illustration of backward head tilt in RSL and NGT, see figure 3.4. Although the data was annotated for all kinds of tilts, it seems that only backward head tilt can be related to focus.

Again, RSL behaves quite differently from NGT. Backward head tilt is hardly ever used: only four subjects and three objects out of 177 sentences with subject, verb, or object focus are marked by a head tilt (if we only take into account sentences with non-focused material present, only five backward head tilts are left). Given the very small number of potential examples, it is plausible to argue that focus in RSL is not marked by head tilt, and that this marker may have some other function in these examples.

In NGT, backward head tilt is indeed used to mark focus. Use of head tilt is observed in 21% of the sentences (41 out of 198, 21 of them are in not focus-only sentences, the difference with RSL is significant: $\chi^2=24.8012$, $df=1$, $p<0.0001$, Cramer’s $V\approx 0.25$). Again, this marker is not extremely common; yet, backward head tilt on the non-focused part of the sentence only is not attested at all. Different types of focus are equally likely to be marked this way. However, similar to what Crasborn and van der Kooij (2013) found, object focus is marked by backward head tilt significantly more often (see figure 4.14) (logistic regression model shows a weak but significant correlations: $R^2=0.077$; $G=10.03$; $df=2$; $p=0.0067$).

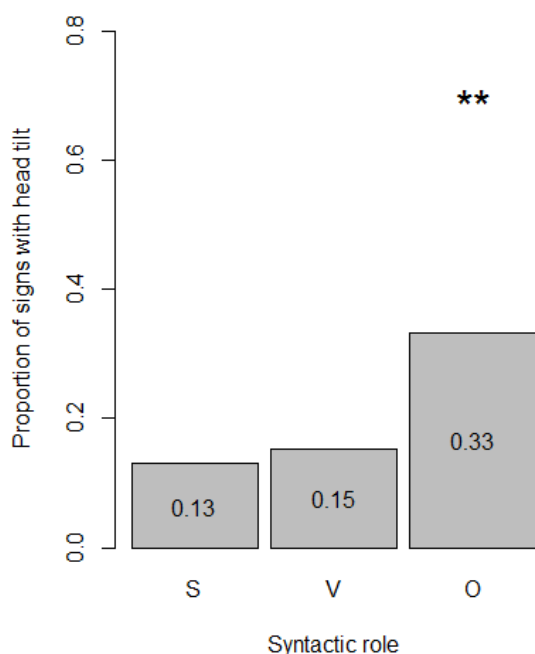


Figure 4.14. Proportion of focused signs with backward head tilt across syntactic roles in NGT. Difference between object focus and the other types is significant.

4.5.3 Body lean

As discussed in section 2.3.3, forward and backward body leans are connected to focus in ASL and in NGT (Wilbur and Patschke 1998; Crasborn and van der Kooij 2013). For RSL again no previous results are available.

In our data set, body lean is rarely used to mark focus. In particular, in RSL forward and backward body lean is extremely rare (eight and nine cases out of 196 analyzed sentences, respectively). There is a tendency to use forward (fbl) and backward body leans (bbl) with verb focus (20a). In NGT, the same picture can be observed. Forward and backward lean is used in eighteen and seven cases (out of 214 analyzed here), respectively, and again, they are mostly observed in cases of verb focus (20b). This might actually mean that leans are not marking focus at all in our data. They might rather be a part of the role shift, that is, the signer tilts the body as a part of taking the role of a character.

- (20) a. $\text{MAN IX-a} \quad \overline{\text{fbl}} \quad [\text{CL:CUT.HAIR}]_{\text{FOC}} \quad \text{IX-b} \quad [\text{RSLf-20-16}]$
 ‘The man is cutting her hair.’
- b. $\text{MAN IX BALL} \quad \overline{\text{fbl}} \quad [\text{CL:THROW}]_{\text{FOC}} \quad [\text{NGTf-35-f8}]$
 ‘The man is throwing the ball.’

In addition, both languages use sideward leans to express corrective and selective focus. These cases are discussed further in section 4.7.

4.5.4 Head nods

Head nods have been identified as a marker of focus in different sign languages, as discussed in section 2.3. Crasborn and van der Kooij (2013) argued that focused subjects are sometimes followed by a shallow head nod, and that contrasted constituents in general are often accompanied by a large nod. In our data, it is also possible to distinguish two types of head nods, which we call large nods and small nods (“shallow” in the terminology of Crasborn and van der Kooij). Large nods are larger in trajectory; in addition, they are often single, while small nods are mostly repeated. Both types of nods may either accompany a constituent or follow it, that is, in the latter case, they are not simultaneous with any manual sign.

In RSL, both types of nods only mark selective focus. In addition, verbs are hardly ever marked by head nods in general (one case each of large and small head nod), while both subjects (21a) and objects (21b) can be marked by either small nods (‘sn’) or large nods (‘ln’), although this strategy is not very frequently observed: eight cases and five cases, respectively, out of 70 sentences with selective focus on subject, object or verb. Note that nods on the non-focused part of the sentence only have not been attested at all. However, quite often the nods precede the answer, not being aligned with the sign in focus, as in (21c). Therefore, it is possible to argue that in such cases nods mark the type of focus, but not its scope.

- (21) a. $\overline{\text{sn}} \quad [\text{BOY}]_{\text{FOC}} \quad \text{WALK} \quad [\text{RSLf-10-16}]$
 ‘A boy is walking.’ (selective focus)
- b. $\overline{\text{sn}} \quad [\text{DOG}]_{\text{FOC}} \quad [\text{RSLf-12-19}]$
 ‘(She is caressing) a dog.’ (selective focus)

- c. sn [WOMAN]_{FOC} [RSLf-12-1]
 ‘The woman (is building a house).’ (selective focus)

NGT, on the other hand, uses large head nods much more often. In particular, 24% of all focused constituents (i.e. 48 out of 198) are marked with large head nods. In addition, 12 constituents (6%) are marked with small head nods. Note that, similar to RSL, nods on the non-focused part of the sentence only have not been attested at all. In contrast to RSL, all types of focus can be marked by large head nods, not only selective focus. In (22a), for instance, information focus is marked by a large nod. These data do not confirm Crasborn and van der Kooij’s (2013) finding that only subjects can be marked by small head nods: in selective focus, objects can be marked in this way as well (22b). Note also that the nods in this example do not follow the focused sign, but are aligned with it; however, both large and small head nods sometimes follow the focused sign, as in (22c-d), and, similar to RSL, they can precede the answer (22e). In addition, small nods are never used with corrective focus, which confirms the existence of these two distinct types of head nods.

- (22) a. ln
 [CHILD / CLEAR / CHILD]_{FOC} EAT [NGTf-30-f3]
 ‘Clearly a child is eating.’ (information focus)
- b. sn
 CANARY CANARY2 [NGTf-12-f3]
 ‘(The girl is playing with) a canary.’ (selective focus)
- c. ln
 [THROW]_{FOC} PU [NGTf-35-f3]
 ‘He throws it.’ (information focus)
- d. sn
 [FATHER]_{FOC} [NGTf-11-f6]
 ‘(The boy kisses) his father.’ (selective focus)
- e. ln
 MAN FALL [NGTf-16-f4]
 ‘A man fell down.’ (selective focus)

Finally, if we group the two types of nod marking together in NGT, it is clear that there are differences between different types of focus and between different syntactic roles (logistic regression model shows a weak but significant correlations: $R^2=0.201$; $G=30.33$; $df=4$ $p<0.0001$). In particular, selective and corrective foci are much more likely to be marked with nods than information focus (which confirms Crasborn and van der Kooij’s findings), and also subjects are more likely to be marked with nods than other roles (figure 4.15).

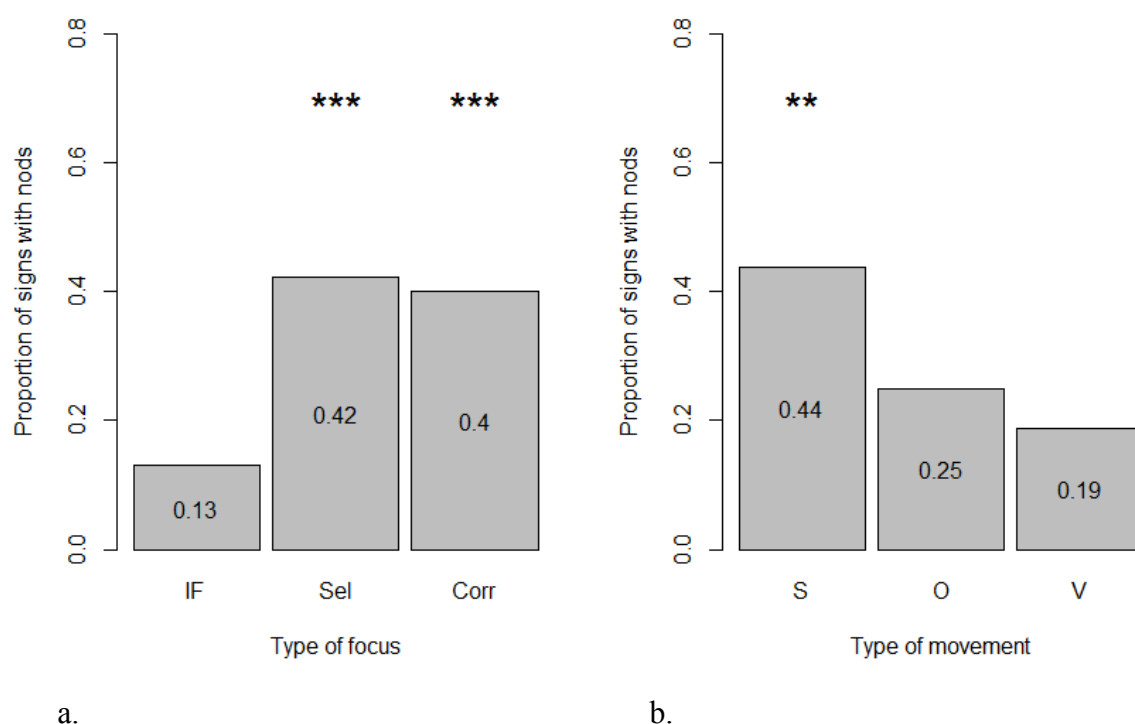


Figure 4.15. a) Proportion of focused signs marked by head nodes across types of focus in NGT. Differences between information focus (IF) and other types of focus (selective (Sel) and corrective (Corr)) are highly significant. b) Proportion of focused signs marked by head nodes across syntactic roles in NGT. Differences between subject focus and other syntactic roles are highly significant.

To sum up, in RSL head nodes are used in a much more restricted way for focus marking: they only mark selective focus, and they are often sometimes not aligned with the focused constituent. In contrast, in NGT, all types of focus can be marked by head nodes. In addition, head nodes as a marker of focus in NGT show typologically common strategies: contrastive focus is more marked than non-contrastive focus, and also subject focus is the most marked among the focus domains. Crasborn and van der Kooij (2013) found that head nods for contrastive focus accompany all constituents except for objects, while in our findings objects are indeed less likely to be marked by head nods than subjects, but so are verbs.

4.5.5 Mouthing

Crasborn and van der Kooij (2013) argued that mouthing is one of the most important markers of focus in NGT. They claimed that focused signs are always accompanied either by mouthing or by mouth gestures. Nevertheless, they acknowledged that mouthings also frequently accompany non-focused constituents; it is therefore unlikely that mouthing is a dedicated focus marker. In addition, they observed that mouthing on focused constituents is different from mouthing on non-focused constituents in two respects. First, it is not reduced, that is, the whole word is mouthed clearly. Second, contrastively focused verbs are accompanied by mouthing and not by mouth gestures when in focus, although in general, verbs are more likely to be accompanied by mouth gestures.

In the current study, we also found that most of the focused items in both RSL and NGT are accompanied by mouthing. For example, if we look at subject, object and verb focus in NGT, subjects are marked with mouthing in 97% of the sentences (75 out of 77 cases), and

objects are marked in 100% of the sentences (72 cases), while verbs are marked by some mouth action in 72% of the sentences (34 out of 47 cases). A similar picture emerges from the RSL data: subjects are accompanied by mouthing in 92% of the sentences (68 out of 74), objects in 94% of the sentences (44 out of 47 cases), and verbs in 71% of the sentences (34 out of 48 sentences).

However, this does not mean that non-focused constituents are not marked in this way. In order to scrutinize the differences between focused and non-focused constituents, we looked at sentences which contain some non-focused material. Table 4.8 summarizes the results. It is clear that in both languages, focused items are quite often the only constituents with mouthing, but that other constituents are also marked in many cases. Moreover, 32% of all cases in NGT and 24% of all cases in RSL contain marking on all elements in the sentence, focused and non-focused elements alike.

Table 4.8. Mouthing in sentences with focused and non-focused signs in RSL and NGT across syntactic roles in sentences with non-focused material present.

	NGT			RSL		
	<i>Mouthing only on focus</i>	<i>Other pattern</i>	<i>total</i>	<i>Mouthing only on focus</i>	<i>Other pattern</i>	<i>total</i>
S	16 (46%)	19 (54%)	35	43 (67%)	21 (33%)	64
O	17 (49%)	18 (51%)	35	29 (58%)	21 (42%)	50
V	12 (40%)	18 (60%)	30	20 (37%)	34 (63%)	54

It is clear that mouthing per se is not used to mark focus, as it often accompanies non-focused material as well in both languages. On the other hand, focused signs indeed have a higher chance of being accompanied by mouthing than non-focused ones.

We could not confirm Crasborn and van der Kooij's observation that (contrasted) verbs in focus are often marked by mouthing, and not by mouth gestures in NGT. Looking at sentences including non-focused material, we only found three cases in which the verbs were marked by mouthing, while in nine cases, the verb was accompanied by a mouth gesture; note that eight of the nine verbs accompanied by mouth gestures were in corrective or selective focus. In RSL, eight of the focused verbs in similar conditions were accompanied by mouthing and twelve by mouth gestures; again note that ten of the verbs accompanied by mouth gestures were in corrective or selective focus. This indicates that in both languages, verbs can be accompanied either by mouth gestures (more often) or by mouthing (less often), and the choice of one over the other does not seem to depend on the presence of focus.

To sum up, our data do not indicate that mouthing is a dedicated marker of focus in either RSL or NGT. Both focused and non-focused constituents can be marked by mouthing or mouth gestures, nouns probably more so than verbs. On the other hand, focused items seem to be accompanied by mouthing more often than non-focused ones. Note that we did not analyze the clarity of mouthing on focused and non-focused constituents; this issue is left for future research.

4.5.6 Eye gaze

Crasborn and van der Kooij (2013) found that all focused constituents in NGT are accompanied by eye contact between the signer and the addressee. They acknowledged, however, that eye gaze at the addressee is probably the default behavior, that is, non-focused information is also quite often accompanied by eye gaze at the addressee. However, in their

data, the focused information was always marked this way, and there were some interesting cases in which only the focused constituent was accompanied by eye gaze at the addressee.

In the current study, we found similar patterns for NGT. Again, as in the previous section, it is insightful to look at sentences that contain both focused and non-focused information (see table 4.9). The column “addressee” contains the cases where only the constituent in focus is accompanied by eye gaze at the addressee, while during the production of the rest of the sentence, eye gaze is directed elsewhere. “Addressee all” contains the cases where the whole sentence is accompanied by eye gaze at the addressee, while the column “not” contains the cases in which the focused constituent is not marked in this way, while the rest of the sentence is.

Table 4.9. Eyegaze in sentences with focused and non-focused signs in NGT across syntactic roles.

	addressee	not	addressee all	total
S	7 (16%)	4 (9%)	32 (74%)	43
O	8 (20%)	1 (2%)	32 (78%)	41
V	9 (29%)	5 (16%)	17 (55%)	31

From table 4.9, it is clear that focused constituents are almost always accompanied by eye gaze at the addressee. The only exception to this pattern are verbs; however, this is explained by the fact that one of the verbs under study was CLOSE.EYES which was usually signed with eyes closed. What is also clear from this table is that most of the time, the whole sentence is accompanied by eye gaze at the addressee, making it the default behavior. The existence of some cases in which only the focused constituent is marked this way confirms the observation of Crasborn and van der Kooij (2013) that focused signs are somewhat more favored with respect to this type of marking.

Table 4.10. Eye gaze in sentences with focused and non-focused material in RSL across syntactic roles

	addressee	not	addressee all	total
S	16 (33%)	10 (21%)	22 (46%)	48
O	15 (33%)	15 (33%)	16 (35%)	46
V	11 (22%)	16 (32%)	23 (46%)	50

In RSL, the general tendencies are similar, although there are some differences to NGT (the differences between RSL and NGT are significant: $\chi^2=23.6181$, $df=2^{55}$, $p<0.0001$, Cramer’s $V\approx 0.3$). Table 4.10 presents the RSL data. For all syntactic roles, we find more instances of focused constituents not marked by eye gaze at the addressee, but at the same time, there are also more instances in which a focused item is marked by eye gaze at the addressee to the exclusion of the rest of the sentence. This also means that fewer sentences are marked as a whole by eye gaze at the addressee. It might be the case that in RSL the default eye gaze behavior is slightly different from NGT. However, for RSL it is even clearer that eye gaze at the addressee is not used as a marker of focus, as there are many cases where the focused constituent is not accompanied by this marker at all.

To sum up, eye gaze at the addressee is the most typical behavior in both languages, but more so for NGT. In NGT, focused constituents seem to be more likely to be accompanied by eye gaze at the addressee than non-focused constituents. For RSL, it is not clear whether eye

⁵⁵ For the sake of simplicity, for this comparison syntactic roles are collapsed.

gaze has any relation to focus. In both languages, eye gaze definitely cannot be analyzed as a dedicated focus marker.

4.5.7 VP and sentence focus

The issue of focus projection is even more interesting for the non-manual focus markers because non-manuals are known to spread (at least in some sign languages, including RSL and NGT, see Pfau and Quer 2010). Therefore, in order to mark VP focus or sentence focus with eyebrow raise, the signer could simply choose to raise the eyebrows during the duration of the whole focused constituent. The same is true for head tilts and body leans. Head nods cannot spread as such, but they can be (and often are) repeated, so again an alignment between the non-manual marker and the scope of focus is possible. Therefore, it would be surprising to find that non-manual markers of focus project, in other words, that they do not spread across the whole focus domain but only mark a part of it.

There is one type of marker that does spread across several constituents in RSL and NGT, namely eyebrow raise. In section 4.5.1 we discussed cases in both RSL and in NGT, in which eyebrow raise marks the whole answer to a question, including focused and non-focused constituents. As argued in that section, this eyebrow raise should probably not be analyzed as a focus marker, but as an affirmative marker instead. Therefore, this phenomenon is not relevant to the issue of focus projection.

As the previous sections have shown, RSL uses few non-manual markers of focus. Eyebrow raise and head tilts are not used, body leans and head nods occasionally. However, in VP and sentence-focus cases, both markers are extremely rare. In the few cases they are used, they only accompany the verb which means that no spreading is observed (23). Examples like this can therefore be analyzed as instances of focus projection.

- (23) MAN [BABY fbl CARRY]_{FOC} [RSLf-16-12]
 ‘The man carries a baby.’

In NGT, non-manual markers of focus are in general more common. If we look at VP and sentence focus, however, we also find a very small number of examples. Actually, all the patterns that we describe below are based on one or two examples, so no detailed analysis can be provided. Future research is needed to study focus marking in VP and sentence focus contexts.

Under VP focus, eyebrow raise often marks only the object (24a). Recall that in chapter 3 we discussed that in the corpus data analyzed, VP focus is also sometimes marked by eyebrow raise only on the object. It is thus clear that the spreading of eyebrow raise is not used for marking the whole focused VP and that focus projection applies instead.

In the case of sentence focus, usually the whole sentence is marked (24b), but it is difficult to distinguish between a potential focus-marking function of this brow raise and the function of affirmation described above.

- (24) a. MAN er [BOY CL:CARRY]_{FOC} [NGTf-6-f3]
 ‘The man is carrying a boy.’
 b. er
 [HOUSE BURN]_{FOC} [NGTf-8-f5]
 ‘A house is burning.’

In both a few VP and sentence focus cases, it is the verb that is non-manually marked with a head tilt or body lean (25a,b). In a couple of cases objects are marked, but again, no spreading is observed (25c).

- (25) a. $\overline{\text{bht}}$
MAN [CHILD CL:PUSH]_{FOC} [NGTf-22-f10]
'The man is pushing a child.'
- b. $\overline{\text{fbl+bht}}$
MAN PERSON IX [CHILD CL:CARRY]_{FOC} [NGTf-6-f1]
'The man is carrying a child.'
- c. $\overline{\text{bht}}$
MAN IX-a [CL:PUSH ON BOY IX-b]_{FOC} [NGTf-22-f8]
'The man is pushing a boy.'

In VP focus, the object is usually marked with a head nod (26a), and in sentence focus either the verb or the subject can be marked (26b,c). In one example, the whole sentence in focus is marked with large head nods (26d). Therefore, most of the times we observe focus projection, but spreading also exists.

- (26) a. $\overline{\text{ln}}$
MAN [ON BOY CL:PUSH CL:FALL]_{FOC} [NGTf-22-f6]
'The man is pushing a boy.'
- b. $\overline{\text{ln}}$
[PEOPLE CELEBRATE]_{FOC} [NGTf-15-f10]
'People are celebrating.'
- c. $\overline{\text{sn}}$
[MAN PERSON CL:FALL]_{FOC} [NGTf-16-f5]
'A man fell.'
- d. $\overline{\text{ln}}$
[MAN CL:FALL]_{FOC} [NGTf-16-f7]
'A man fell.'

All the examples above show that in NGT as well focus projection can be observed with respect to non-manual markers, similar to the pattern found for manual prosodic markers (section 4.4.5). The data suggest that non-manual marking, despite being a potentially convenient tool for marking the focus domain by means of spreading, are not often exploited for the purposes of focus marking.

In this section, we did not discuss sideward body leans that are used to mark contrast in both sign languages. Unlike other non-manuals, they do spread, as we will show in section 4.7.

4.5.8 Summary

RSL and NGT appear to be quite different with respect to non-manual markers of focus. In particular, RSL does not use eyebrow raise and head tilt, and only rarely body lean. Head nods are used to mark focus in some cases, but only with selective focus. Mouthing is clearly not a focus marker per se (although it is associated with focus), and eye gaze is not even clearly associated with focused information.

In contrast, non-manuals play a relatively important role in marking focus in NGT. Eyebrow raise is used to mark different focus types; backward head tilt is mostly used to mark object focus. Sideward and forward body leans are used (albeit rarely) to mark focus whereas head nods are quite common, although there is a preference for contrastive focus to be marked this way. The use of mouthing is similar to RSL: it is associated with focus but not used as a focus marker. Eye gaze at the addressee also is not bound to focus, although it more often co-occurs with focused information.

Comparing our results for NGT with those of Crasborn and van der Kooij (2013), it emerges that most of the properties of non-manual marking of focus are similar, but there are some subtle differences. For example in our data all syntactic roles are equally likely to be marked by eyebrow raise. We also did not confirm their finding that small head nods are only used to mark subject focus: in our data, object and verb focus can be marked this way as well. Finally, we were not able to confirm that contrastive verb focus results in mouthing instead of mouth gestures.

In section 4.5.7 we have shown that focus projection exists in the domain of non-manual marking in NGT (and probably in RSL, although the data are extremely limited). In particular, non-manual markers generally do not spread to align with the focus domain in cases of VP and sentence focus; only one of the constituents in focus is marked. This is the case despite the fact that non-manuals in general can and do spread (see discussion in section 4.8).

Native and non-native NGT signers were compared to each other with respect to the relevant non-manual markers of focus (using Pearson's Chi Squared Test and Fisher's Exact Test for Count Data). Surprisingly non-native signers used eyebrow raise and body leans more often than native signers, but were similar on the other parameters. It might be the case that non-native signers overgeneralize the use of these markers and use them in a less restricted way than native signers; however, further research is needed to confirm this hypothesis.

4.6 Interaction of syntactic, prosodic, and non-manual markers

In sections 4.3-4.5, focus in both RSL and NGT was shown to be marked by a variety of means: syntactic, prosodic and non-manual. It is therefore important to find out whether these markers interact with each other (QF5). On the one hand, it might be the case that different markers are commonly used in combination or they could be in complementary distribution: for example sometimes focus is marked by manual prosody and at other times by non-manual markers. In this section, we report the exploratory results on this interaction.

With respect to syntactic markers, we have seen that doubling is sometimes used to mark focus in both languages. In addition, we have seen that the non-focused material is often elided. These features may interact with manual marking. Therefore, we can ask the following questions: 1) Is there a difference in manual prosodic markers between sentences with and without doubling? 2) Is there a difference in manual prosodic markers between focus-only and not focus-only answers? The motivation for the first question is that when doubling is used, focus is clearly expressed, and there is thus no need to also mark it prosodically. The second question is motivated by similar considerations: when only focused material is left in the sentence, again there is no need to additionally mark focus.

No difference was found between sentences with and without doubling: manual prosodic marking is used in both contexts. It is important to note, however, that the two instances of the doubled constituent are usually different prosodically: the first instance is quite often marked by length, repetitions and other markers, while the second instance is often reduced (see also chapter 5, where we come to similar conclusions based on corpus data).

There also seems to be no interaction between ellipsis and prosodic marking. In RSL, focus-only answers do not differ significantly from full answers according to any of the prosodic markers of focus. In NGT, only one of the prosodic markers acts differently for elided and non-elided answers, namely the number of repetitions. However, the tendency found is contrary to our expectations: elided answers use this marker more than non-elided answers, and the effect size is small ($\chi^2=7.3415$, $df=2$, $p=0.02546$, Cramer's $V\approx 0.2$).

In sum, syntactic markers of focus and prosodic manual markers of focus do not interact: they are often used in combination and there is no evidence of complementary distribution.

Examining the interaction of non-manual prosodic markers and syntax, we only need to consider the NGT data, since it has been shown that in RSL non-manuals are hardly ever used to mark focus.

Using the same logic as above, fewer non-manuals should be used in the presence of doubling or in focus-only answers, as the marking of focus should be clear enough. However, as with manual prosodic markers, no significant differences can be found between sentences with or without doubling, or between elided and non-elided answers. Eyebrow raise, head tilts, body leans, and head nods are all used equally frequently in all types of contexts.

Finally, for NGT we can also look at the interaction between the presence of manual prosodic cues and non-manual marking. Since length is the most representative manual prosodic marking, being used most often and combining the effects of other markers, we compared non-manual markers in the presence or absence of length marking in NGT. No significant differences were found: eyebrow raise, head tilts, body leans, and head nods are used equally in the presence and absence of length marking of focus.

Crasborn and van der Kooij (2013) discussed the possibility that some non-manuals, namely eyebrow raise, eyes wide open, and backward head tilt, are all phonetic realizations of the same underlying prosodic feature used to mark prominence, and, therefore, focus. If we extend this idea even further, it might be possible that prominence can have different realizations: syntactic, prosodic, and non-manual, and each of these types can express focus on its own. If this is the case, we would expect combinations of different markers to be rare, since more than one marker would be redundant. However, we have not found any such interactions between syntactic, manual prosodic and non-manual markers of focus. The markers are not in complementary distribution. This makes an abstract underlying feature of prominence that is used to mark focus unlikely.

4.7 Marking contrast

As discussed in section 2.3.4, sign languages use space to express contrast. This is a modality-specific strategy (QF6). In particular, contrasted referents can be located in contrastive locations in space with the help of pointing. In addition, contrast can be expressed by sideward body leans (van der Kooij et al. 2006) and also by dominance reversal (Frishberg 1985), that is, by using one hand to sign one of the contrasted referents, and the other hand to sign the other one.

As mentioned in section 4.5.3, we found some sideward leans expressing contrast in the data from the question-answers. Even more such examples occur in the data elicited with the help of pictures from QUIS (see section 4.2.4.6). Figure 4.16 illustrates typical leans in RSL. Note that sometimes the sideward lean is only realized with the head, not the whole body. The data shows that leans often accompany the whole contrasted clause, not just the contrastive topic or focus (10a). In NGT, a common pattern is that only the second clause is marked with the lean, while the first one is unmarked (10b). In the RSL example (10c) contrastive marking on the clause level is used alongside with topic marking on the noun phrase IX BOY IX in the

second sentence. This shows that contrastive marking is orthogonal to topic and focus marking.



a.

b.

Figure 4.16. Rightward (a) and leftward (b) body lean in RSL, from example (28)

- (27) a. $\frac{\text{lbl}}{\text{CAT [BITE BOY]}_{\text{FOC}}}$ $\frac{\text{rbl}}{\text{IX DOG [BITE GIRL]}_{\text{FOC}}}$ [RSLf-25-10]
 ‘The cat bites a boy. The dog bites a girl.’
- b. $\frac{\text{rbl}}{\text{DOG [ON GIRL BITE]}_{\text{FOC}}}$ $\frac{\text{rbl}}{\text{CAT [BITE ON BOY]}_{\text{FOC}}}$ [NGTf-26-f1]
 ‘The dog bites a girl. The cat bites a boy’
- c. $\frac{\text{lbl}}{[\text{DOG}]_{\text{FOC}} \text{ GIRL IX-a } [\text{SCRATCH}]_{\text{FOC}}}$ $\frac{\text{er}}{\text{IX-b BOY IX-b } [\text{CAT GRAB}]_{\text{FOC}}}$
 ‘A dog scratches the girl. The boy, a cat grabs him.’ [RSLf-26-13]

In some examples, only the focus is marked with the leans, while the contrasted topics are not marked (28). Further research is needed to find out when exactly the sideward leans spread across clauses and when they are only used with focus.

- (28) $\frac{\text{lbl}}{\text{MAN WAS } [\text{CL:SIT CL:HORSE.RIDE}]_{\text{FOC}}}$ $\frac{\text{rbl}}{\text{WOMAN } [\text{BIKE CL:RIDE.BIKE}]_{\text{FOC}}}$
 ‘The man rides a horse. The woman rides a bike.’ [RSLf-26-1]

The fact that sideward body leans spread to mark the whole sentence distinguishes them from all non-manual markers of focus discussed in section 4.5. This may be another argument in favor of treating them as marking a separate category of contrast, as they behave differently from focus-marking non-manuals.

In addition, dominance reversal, when the signer uses one hand to sign one sign and the other hand for another sign (see sections 2.3 and 2.5), is sometimes used to express contrast as well, usually in combination with body leans. In (29) the signs DOG and CAT are signed with two separate hands. We do not analyze dominance reversal here in any detail as it deserves a separate study, but our findings confirm that this is one of the strategies to realize focus and it is related to the other spatial strategy, sideward leans.

- (29) a. h1: lbl rbl DOG BITE [RSLf-25-12]
 h2: CAT BITE
 ‘The dog bites (the boy) and the cat bites (the girl).’
 b. h1: rbl lbl CAT BITE [NGTf-26-f10]
 h2: DOG BITE
 ‘The cat bites (the girl) and the dog bites (the boy).’

Finally, one NGT signer used sideward leans in two sentences with Information Focus. This might be an idiolect or some unknown factors may be responsible for the presence of the lean; for instance, the signer might have induced a contrastive reading despite the fact that no contrast was intended. We do not consider these examples evidence enough to claim that non-contrastive focus can be marked this way.

A question might arise whether this strategy of spatially contrasting referents is not just a typographic representation. In other words, the stimuli represent the boy and the dog on the one side of the picture, and the girl and the cat on the opposite side, so localizing them on the opposite sides of the signing space might be an iconic description of the situation, without implying a contrast. There are several arguments against such an analysis.

First, consider example (30) (same as (29a) but with context). The referents CAT and DOG have been localized in the first two clauses. Therefore, the body leans in the third clause are not necessary and not informative: we already know where the cat and the dog are. The leans have some additional function, which in this case seems to be emphasizing the contrast between these referents.

- (30) lbl rbl lbl rbl
 IX-a GIRL STAND DOG STAND. IX-b BOY STAND CAT STAND. DOG CAT BITE.
 ‘There is a girl and a dog, and a boy and a cat. The dog bites (the boy) and the cat bites (the girl).’ [RSLf-25-12]

Secondly, in some cases the signer does not reflect the positions of the referents in the pictures correctly. For instance, RSL signer 16 localized the woman on the bike to the right in sentence 27 and then to the left in sentence 28, although the stimulus picture is the same in both cases.

Finally, van der Kooij et al. (2006) demonstrated that leans are also used in sentences that are not elicited with the help of pictures; moreover, sometimes abstract referents or actions are contrasted, as in (31) from van der Kooij et al. (2006:1607).

- (31) neg lbl rbl
 NO / IX-a RIDE-BIKE / IX-b ASL STUDY / IX-b [NGT]
 ‘No, he is not out biking, he is studying ASL.’

4.8 Discussion

Previous research discussed in section 2.3 showed that syntactic, manual prosodic, and non-manual markers are used cross-linguistically to express focus and the current study has shown that this is also the case for RSL and NGT. In addition, both languages use a modality-specific strategy of body leans to express contrast in certain situations. However, the answers to the six research questions were spread throughout several sections. Here we will pull these results together with a brief discussion.

It is clear that the two languages use similar strategies to express focus (QF1). In particular, ellipsis of the non-focused part and doubling are the syntactic strategies used by both languages. Manual prosodic markers such as repetition and modification of the size, speed and length of movement, as well as the height of the sign, are used by both languages. NGT uses non-manual markers, such as eyebrow raise, backward head tilts, head nods and body leans to express focus. In contrast RSL only uses nods and body leans, and less often than NGT. Both languages have evidence of focus projection, for both manual and non-manual markers of focus.

Interactions between syntactic, manual prosodic and non-manual markers of focus in RSL and NGT were studied in section 4.6. These markers are not in complementary distribution, but are in fact used in combination to express focus.

In the following sections the results pertaining to the other research questions will be summarized and discussed in terms of their typological and theoretical consequences. In section 4.8.1 we discuss different types of focus (QF2). In section 4.8.2 we address the issue of focus projection (QF3) and section 4.8.3 is devoted to the comparison between RSL and NGT (QF4). Finally, in section 4.8.4 we discuss the modality effects in the domain of focus marking (QF6).

4.8.1 Focus types and marking

As discussed in chapter 1, a distinction is commonly made between information focus, which is the most common type of focus used to convey new information, and contrastive focus, used to contrast alternatives. Some researchers (Dik 1989) further distinguish subtypes of contrastive focus: selective, corrective, and others, related to different means of expression in some languages. On the other hand, some researchers (Rooth 1992, Krifka 2008) argue that focus is always contrastive: the definition of focus always involves alternatives which are contrasted with each other. This predicts that focus and contrast will not have separate means of expression. Instead, focus can be less or more contrastive, so the difference between contrastive and non-contrastive focus would be one of quantity and not quality.

The RSL and NGT data collected in this study provide evidence with respect to this issue (QF2). From the sentences with information, selective and corrective focus it is possible to see whether these types are marked differently. In addition, we collected sentences with contrastive foci and topics to observe the interplay between topic, focus, and contrast.

Table 4.11 lists those markers of focus in RSL and NGT that show some differences across focus types. Where all three cells are grey for one language, this means that no difference was found between the focus types. Where one cell is white, this means that this type of focus is marked differently to the other two. For instance, for the marker “ellipsis” corrective focus is white and indicated as less, implying that this marker is used less than both information and selective focus.

Table 4.11. Differences in focus markers between types of focus in RSL and NGT. Grey cells imply that they are similar with respect to this marker; the differences are indicated in non-highlighted cells.

Marker	RSL			NGT		
	Information	Selective	Corrective	Information	Selective	Corrective
<i>Ellipsis</i>						less
<i>Length</i>				more		
<i>Size</i>	more					
<i>Height</i>	more					
<i>Nods</i>		only		less		

Table 4.11 shows that many parameters (including all those not included in the table) do not distinguish types of focus in RSL and NGT. Moreover, there is no single marker that distinguishes all three types of focus. On the other hand, in both languages a combination of markers does distinguish all types. In RSL, size and height marking distinguish information focus from the two other types, while head nods distinguish selective focus from the two other types. In NGT, length and head nods distinguish information focus from the two other types, while ellipsis distinguishes corrective focus from the other types.

Apart from one marker – head nods in RSL – none of the markers categorically distinguishes types of focus. In other words, all markers are used with all three types of focus in both languages, and the distinction is based on frequency only. We must therefore conclude that although it is indeed useful to speak of three different types of focus: information, selective and corrective, these types are not separate categories, but subtypes of one category, and the differences are quantitative, not qualitative.

On the other hand, a different picture emerged when we looked at sentences with contrastive topics and foci, elicited with the help of pictures from the QUIS manual. It turned out that sideward body leans (and dominance reversals) are indeed used to mark contrast, and not focus, because it combines with both topics and foci. Note also that sideward body leans are not used to mark non-contrastive focus, so the difference is categorical in this case. This provides a basis for the argument that contrast should be treated as a category orthogonal to focus, and that focus is not inherently contrastive.

However, these markers of contrast in RSL and NGT are quite limited. It seems only to be used when two alternatives are present in the context and when both alternatives are mentioned. Multiple alternatives are marked this way: for instance, in the situations with the cat, the dog, the boy and the girl only a binary contrast between the two situations and not a contrast between all four referents is established. In addition, it might very well be the case that this marker is modality-specific (see section 4.8.4 below), so it would be implausible to use it as an argument in the general debate on the nature of focus and contrast.

4.8.2 Focus projection

Many spoken languages show the phenomenon of focus projection (Arregi, to appear). For instance, in English when the object is stressed, this can be an expression of either object focus, or VP-focus, or the focus on the whole sentence. The reason why focus is underdetermined in this way is probably connected to the economy as one of the major forces driving linguistic expression. Focus marking is often redundant, because it is often clear from the context what the new part of information is; in addition, non-focused information is often elided. Therefore, a slight underdetermination of the focus domain does not come at a cost of communication success.

It is also reasonable to expect that prosodic manual focus marking in sign languages would behave in a similar way. This is exactly what we found: manual prosodic markers of focus in RSL and NGT project, so that in VP and sentence focus only the verb is usually marked with length, or repetition etc. (QF3).

However, the situation is somewhat less predictable in the case of non-manual markers. It is well known that non-manuals in many sign languages spread – they are aligned with the syntactic constituents they mark (Pfau and Quer 2010). For instance, both in RSL and in NGT yes/no questions are marked with raised eyebrows and a backward head tilt that spreads from the beginning to the end of the sentence. As we discussed in chapter 3, topic marking can also spread across several signs. Therefore the same can be expected with focus marking: for VP and sentence focus the non-manual markers would align with the whole focused constituent.

In the case of RSL, non-manual marking of focus is extremely rare. However, in NGT such markers as eyebrow raise and backward head tilt are used quite often. The data clearly show that these focus markers project instead of spreading: in the case of VP-focus, for instance, it is the object that is marked with eyebrow raise, while the verb typically remains unmarked. This suggests that the tendency to economize of linguistic expressions, which also lead to the phenomenon of focus projection in spoken languages, is stronger than the tendency of the non-manuals to align with the syntactic domains that they mark. An interesting exception to this generalization is sideward body leans, which do spread to mark the whole contrasted constituents. As suggested above, this might be an argument in favor of treating contrast and focus separately in RSL and NGT (but see section 4.8.4 below).

4.8.3 Comparison of RSL and NGT

In chapter 3, we have seen that RSL and NTG mark topics in a very similar way (QF4). In particular, we only found one major syntactic difference: NGT uses topic-copying, while RSL does not. If we look at non-manuals, they look almost exactly identical in the two sign languages. However, with focus the situation is quite different. Several differences have been found between RSL and NGT, summarized in table 4.12.

There are differences between RSL and NGT in the use of almost all markers. In the domain of syntactic and manual prosodic marking, the differences are of quantity, not quality. For instance, ellipsis is used more in the task offered to the signers in NGT than in RSL. Many differences concern interactions between focus markers and types of focus or types of movement. This is the case for all manual prosodic markers. Sometimes RSL shows more interactions, and sometimes NGT. On the other hand, with non-manuals the differences are more of a qualitative type. In particular, two of the prominent NGT focus markers – eyebrow raise and backward head tilt – are not used in RSL. Other markers are also used much more commonly in NGT than in RSL. Even eye gaze, not being a marker of focus per se, is associated with focus in NGT but not in RSL.

Table 4.12. Differences in focus marking between RSL and NGT in syntactic, manual prosodic, and non-manual domains

Domain	Marker	RSL	NGT
Syntax	<i>Ellipsis</i>	used less	used more; differences between focus types
	<i>Focus particles</i>	no	SELF – (emphatic) focus particle
Manual prosody	<i>Length</i>		differences between focus and movement types
	<i>Repetitions</i>	used more; differences between movement types	used less
	<i>Speed</i>		differences between movement types
	<i>Size</i>	less often, differences between focus types and movement types	more often, differences between movement types
	<i>Height</i>	differences between focus types and movement types	
Non-manuals	<i>Eyebrow</i>	not used	used
	<i>Head tilt</i>	not used	used
	<i>Head nods</i>	only for Selective Focus	all types of focus
	<i>Eye gaze</i>	no association with focus	some association with focus

We thus conclude that RSL and NGT are similar but not exactly alike with respect to syntactic and manual prosodic markers of focus. They use the same markers, but there are differences in frequency and interactions with focus types and types of movement. However, RSL and NGT are typologically different with respect to non-manual markers of focus. RSL seems to be a manual-dominant language in this domain, barely using non-manuals. NGT is not exactly non-manually-dominant, but it does use some non-manual markers of focus regularly. This is especially interesting as RSL and NGT do not seem to differ with respect to their use of other non-manual markers, such as negation.

4.8.4 Modality effects

There are some obvious differences between sign and spoken languages in modality effects (QF6), especially in the use of space, iconicity and simultaneous expressions with the help of multiple articulators. If we look at expression of focus in RSL and NGT, some of the markers might be modality-specific.

Most markers of focus – syntactic, manual prosodic and non-manual – are similar to markers used in spoken languages. With respect to manual prosodic markers, they are functionally and formally similar to stress or prominence marking in spoken languages. Obviously sign languages use a different modality, so prominence marking is realized through the modification of movement in signs and not through modifying prosodic parameters of sounds, but the result seems to be the same: some sign/words receive prosodic prominence which is associated with focus. Finally, non-manual markers have been analyzed as similar to intonation in spoken language (Pfau and Quer 2010). We do not find any reason to claim that in the domain of focus marking they are used differently from intonation markers of focus in spoken languages (but we will return to this issue in chapter 7).

However, we have seen markers of contrast that are connected to the modality-specific features of sign languages, namely the sideward body leans and dominance reversal. Using contrastive spatial locations to express contrast is of course modality specific – no parallel devices are available within the auditory modality. Moreover, this means is also quite restricted: it is used to express contrast between two overt alternatives. This restriction is modality-specific itself: it is the result of the visual-spatial apparatus that is used: the signers use two hands, so signing one referent with one hand limits the contrast to two referents; sideward leans are also contrastive enough only when there are two sides to lean towards. Therefore, we do indeed find modality-specific markers of contrast in RSL and NGT. Note, however, that body leans at least might and do have similar functions in co-speech gesture (see chapter 6 for further discussion).

5. Doubling

5.1 Introduction⁵⁶

Doubling, whereby some constituent referring to the same object or action occurs twice, is commonly attested in many signed and spoken languages. The RSL examples in (1) and (2) illustrate the phenomenon. The examples also show that the two occurrences of the doubled constituent can be either identical (1) or differ in terms of grammatical markers (2). For example in (2), aspectual morphology is only present on the second occurrence of the verb.

- (1) IX GIRL CL:STAND STILL CL:STAND [RSL-x2-6]
 ‘The girl is still standing.’
- (2) CLOSE CL:GO THERE CL:GO-ASP.CONT [RSL-g1-1]
 ‘There he is going now.’ (progressive meaning)

As discussed in section 2.4, from a theoretical point of view doubling is a challenging phenomenon. One of the main principles that is said to determine language structure and use is economy, but producing the same constituent twice is obviously not economical. Linguists therefore always try to find a motivation for this operation that can overrule economy. The functions that have been related to doubling in spoken and sign languages are emphasis, contrastive or non-contrastive verification, indicating that doubling is commonly used to mark IS. In addition, doubling can be used to “save” constructions that would be otherwise ungrammatical due to limitations on the amount of inflection or incorporation (see section 2.4).

In this chapter, doubling in RSL and NGT is discussed based on the research questions formulated in section 2.4. In both sign languages, different constituents (including verbs, nouns, adjectives, adverbs, and whole clauses) can be doubled (QD1 on the formal properties of doubling). It will be shown that doubling in both languages fulfills similar functions and exhibits similar structure, although there are differences in frequency and in the kinds of constituents that can be doubled. On this basis, a unified explanation for many doubling phenomena on both discourse and clause-internal levels will be provided (QD2 on the functions of doubling). Finally, we address the question why doubling is so commonly used in RSL and NGT, and in other sign languages in general (QD3).

In section 5.2, the methods used for data elicitation in this study are described, followed by a presentation of the data in section 5.3. In section 5.4, several possible analyses of doubling are discussed and a hypothesis concerning grammaticalization of doubling is presented. In section 5.5, certain theoretical considerations are discussed. Section 5.6 summarizes the results.

Before starting, a note on terminology is in order: in a doubling situation X_1 (Y) X_2 , we will call X_1 and X_2 occurrences of constituent X because we want to stay agnostic with respect to the question which of the two occurrences is the original and which is the copy. For the same reason, we will also omit indexes in the following discussion, so that the patterns described will be marked as X X, X Y X, etc.

⁵⁶ Parts of this chapter have appeared in Kimmelman (2012b, 2013). However, here a larger data set is analyzed.

5.2 Methodology

5.2.1 Data collection

This chapter is based on the analysis of two small corpora: one of RSL and one of NGT. We will also mention the data discussed in chapter 4, but we primarily analyze corpus data in this section. The NGT corpus used here is the same as in chapter 3. It consists of retellings of the Canary Row (CR) cartoon and personal stories (PS), and forms part of the Corpus NGT (Crasborn et al. 2008, Crasborn and Zwitserlood 2008). For details see section 3.2.1.

The RSL corpus consists of two parts. The first part includes retellings of the Canary Row cartoon, also used in chapter 3 (see section 3.2.1 for details). The second part is a corpus of narratives collected and annotated by Prozorova (2009). This corpus was not collected specifically to analyze doubling, or even aspects of the grammar of RSL, but rather to examine the prosodic structure of RSL discourse. It consists of 13 stories told by 9 signers. Two stories were based on the *The Pear Film* (PF) (Chafe 1980), the other 11 stories were based on several comic strips by Bidstrup. The stories based on *The Pear Film* are labeled G1 and G2, while all other labels refer to the stories based on different comic strips: Z1-3 are about a winter walk, Sh1,2 are about a hat, So1,2 are about a dog, and X1-4 are about painting.

The setting was different for the retelling of *The Pear Film* and the comic strips. In the case of *The Pear Film*, the signers were asked to watch the movie twice and then retell the story for the camera. During the recording, only the hearing researcher was present in the room. In the case of comic strips, two signers participated. One of them was given time to look at one of the comic strips, the strip was then removed and the signer was asked to re-tell the story. The procedure was then repeated with a different comic strip. The first story was used to familiarize the signer with the procedure; only the rendition of the second story was used for later analysis. Subsequently, the signers switched roles, and the addressee (the second signer) told two different stories to the first signer. Again, only the second rendition was analyzed.

All the data has been annotated as described in section 3.2.1. In addition, instances of doubling were identified and annotated. This analysis is further discussed in section 5.3.3.

5.2.2 Participants

The NGT data include signed texts from 15 signers, eleven female and four male, mainly from the Amsterdam region (see section 3.2.3 for more details). For the reader's convenience, the sociolinguistic characteristics of the NGT signers are presented again in table 5.1.

Data were analysed in total from 15 RSL signers. Six signers who participated in the retelling of Canary Row stories were from the Moscow region (see also section 3.2.3). In addition, nine more deaf signers participated: four men and five women; information about the participants is provided in table 5.2.

Table 5.1. Characteristics of NGT signers

Signer	Sex	Age	Age of exposure	Region	Type of data
1	male	69	0	Amsterdam	PS
2	female	81	2;6	Amsterdam	PS
3	female	63	0	Amsterdam	PS, CR
4	female	77	0	Amsterdam	PS, CR
9	female	30	14	Rotterdam	PS
10	female	35	3	Amsterdam	PS
11	male	39	0	Amsterdam	PS, CR
12	male	39	0	Amsterdam	PS, CR
47	female	59	4	Voorburg	PS
71	male	45	2	Amsterdam	CR
72	female	66	2	Amsterdam	CR
73	female	17	1	Amsterdam	CR
74	female	43	2;6	Amsterdam	CR
83	female	64	2	Amsterdam	CR
84	female	67	5	Amsterdam	CR

Table 5.2. Characteristics of RSL signers

Signer	Sex	Age	Age of exposure	Region	Types of data
1	male	39	0	Moscow	PF
2	male	41	0	Moscow	PF
3	male	38	0	Moscow	PF
4	female	26	0	Magadan	PF
5	female	23	7	Moscow	PF
6	female	26	5	Moscow	PF
7	female	27	6	Moscow	PF
8	male	36	7	Moscow	PF
9	female	25	0	Chelyabinsk	PF
10	female	30	0	Moscow	PS, CR
12	female	50	0	Moscow	PS, CR
16	female	29	0	Moscow	PS, CR
18	male	58	3-4	Moscow	PS, CR
19	male	55	0	Moscow	PS, CR
20	female	41	0	Moscow	PS, CR

The average age of the NGT signers at the time of recording was 53, ranging from 17 to 81 years. Except for two signers, all signers come from the Amsterdam region. Eight of the signers were exposed to NGT before the age of three. The average age of the RSL signers at the time of the recording was 36 years, ranging from 23 to 58 years; 12 of them were born and raised in Moscow, and also studied there. One participant was born and raised in Magadan (a city situated 7110 km to the east of Moscow) and another one in Chelyabinsk (a city situated

1700 km to the east of Moscow), but, at the time of data collection, both had already lived in Moscow for several years. Ten subjects came from deaf families and were exposed to RSL before the age of three.

The data samples in the two languages therefore are not fully comparable, as there is a difference in the average age. The possibility that this difference might account for any differences with respect to doubling cannot be excluded, but is unlikely.

5.2.3 Defining doubling

In this research on doubling we choose to work from form to meaning; that is, whenever an instance of doubling is identified, its semantics is analyzed. Therefore, doubling was defined in the broadest terms possible. Specifically, we defined doubling as all instances in which two constituents were used to refer to the same object, action or situation. Thus the final list of doubling constructions of RSL and NGT contained not only prototypical cases of verbal doubling, but also doubling of all types of constituents. This meant that clauses were included as well as instances of non-identical doubling that can be considered repetition. This broad definition of the phenomenon does not imply any theoretical claims. For instance, it is not argued here that doubling as a result of hesitation is of the same nature as verbal doubling. The purpose of using a broad definition was to collect as many *potential* instances of doubling and then classify and analyze them. At the stage of collecting instances of doubling, the researcher can never be sure that a particular occurrence is a production error and not an instance of grammatical doubling. This decision can only be made based on a thorough analysis of doubling in the languages studied. In the following, we will briefly address two phenomena that fall under our definition of doubling, but that would be excluded by stricter approaches to the phenomenon.

First, some linguists would probably disagree with our broad definition since it also includes what they call repetitions (see, for instance, Kibrik and Podlesskaja 2009). For instance, one of the cases in which a constituent can occur more than once is the false start⁵⁷ (Du Bois, Cumming, Schuetze-Coburn and Paolino 1992), whereby a speaker (or signer) in the course of producing a text begins a unit, and then repeats this unit, as in (3).

(3) and <they> -- they poked into <the> the molding[...] [Du Bois et al. 1992:79]

More generally, hesitation can be a reason for the speaker or signer to repeat a constituent (Kibrik and Podlesskaja 2009:196-197).

Another kind of situation that can be considered repetition is echo (Kibrik and Podlesskaja 2009) or afterthought. In this case, some constituent is repeated and information is added for clarification. This phenomenon is illustrated by the RSL example in (4).

(4) OLD.MAN CL:TAKE. FRIEND CL:TAKE [RSL-so2-7]
 'The old man took [it], the friend took [it].'

In (4) we observe a sequence of two clauses that both describe the same event. However, the reference to the actor of this event is specified/clarified in the second clause. The referent OLD.MAN is further specified with FRIEND in the second clause and the verb is repeated. The clarification thus results in an instance of clause doubling.

⁵⁷ A false start does not automatically lead to repetition, but repetition can be the result.

To sum up, some unplanned repetitions in discourse may result from production errors and self-corrections. Although such repetitions obviously differ from doubling as described in sections 5.3.3 and 5.3.4, since they are not a part of the grammatical system in any strict sense, formally they are similar to doubling.

In addition, lexical identity of occurrences was not considered a necessary condition for classifying a construction as doubling. Consider example (5a) from RSL. At first glance, this looks like prototypical verbal doubling, but the two verbs are in fact lexically unrelated: the verb STEAL is a lexical verb with no classifier, while the verb CL:TAKE is a classifier construction; however, both verbs refer to the same action performed by the boy. On the surface, this construction looks very similar to (5b), which involves identical repetition of a classifier construction.

- (5) a. STEAL LIPSTICK CL:TAKE [RSL-x1-4]
 ‘[The boy] stole the lipstick.’
 b. BOY CL:TAKE LIPSTICK CL:TAKE [RSL-x2-6]
 ‘The boy took the lipstick.’

Some researchers (e.g. van Ingen 2010) claim that in cases like (5a), we are actually not dealing with doubling, but rather with a serial verb construction (SVC). However, according to Aikhenvald (2006:30) “synonymous” SVCs, where two verbs are synonyms, are very rare. In prototypical SVCs, both verbs contribute to the overall meaning of the sentence, while in (5a) the verb CL:TAKE does not make any semantic contribution. Therefore there is not enough justification for considering examples like (5a) serial verb constructions.

Because lexical identity at the word level was not considered a necessary condition for doubling, identity was not considered a necessary criterion in the cases of clause doubling either (recall example (4)). Still, as will become clear in sections 5.3 and 5.4, not all instances of doubling are based on the same mechanism.

Based on this definition, 186 instances of doubling were identified in RSL (107 in retellings of the Canary Row cartoon and 79 in the other part of the corpus) and 287 in NGT (151 in retellings of the Canary Row cartoon and 136 in the personal stories) (table 5.3).

Table 5.3. Instances of doubling in the RSL and NGT data

	Canary Row	Other texts	Total
RSL	107	79	186
NGT	151	136	287

5.3 Data

In this section, we will provide a detailed discussion of the properties of doubling in RSL and NGT. In sections 5.3.1 to 5.3.3, we address different doubling patterns. Section 5.3.1 contains a presentation of doubling of the form X X due to hesitation, followed by section 5.3.2 on the doubling pattern X X’ used for clarification/elaboration. Finally, in section 5.3.3, we address doubling of the form X Y X(’), which is the most frequent type of doubling in the present study. Note that the distinction between patterns is a formal one; we will show that for instance the X X pattern is mostly used for hesitation, but there are some instances of this pattern with other functions; conversely we consider pattern X Y X(’) to have the function of foregrounding (see section 5.4), but it can also occur due to hesitation in some marginal cases.

Following the discussion of patterns, morphological and phonetic differences between the occurrences of doubled constituents are considered (section 5.3.4). Section 5.3.5 analyzes the prosody of doubling. In section 5.3.6, characteristics of the data from both sign languages are summarized and compared.

5.3.1 The X X pattern: hesitation

Just as in spoken languages, doubling may occur in both sign languages when the signer hesitates. In (6a) the signer hesitates at the end of the sentence (marked by ‘=’) and then repeats the subject BOY.⁵⁸ This kind of repetition usually involves the X X pattern, in other words, the sign is repeated several times in a row. However, in one or two cases hesitation can also lead to the X Y X(’) pattern to be discussed in section 5.3.3. In (6b) the pointing sign IX associated with the noun MAN is repeated before the noun and after it, as the signer hesitates. Hesitation can result in doubling because it gives the signer time to think and plan further discourse while repeating the sign.

- (6) a. NOT.FAR CL:GO IX CL:GO BOY = BOY [RSL-g1-1]
 ‘Not far [from there] goes a boy.’
 b. IX-a IX-b MAN = IX-a THINK [NGT-208-11]
 ‘The man thinks ...’

In RSL the X X pattern of doubling has been used in 11 cases, i.e. in 6% of the data; in NGT it has been used in 29 cases, i.e. in 10% of the data. The difference may be caused by the fact that all RSL narratives are based on picture or cartoon stimuli, and the signers thus had time to prepare their story (hence, less hesitation), while half of the NGT data are spontaneous narratives in which less preparation is possible. In NGT instances of doubling motivated by hesitation were present in the speech of both older and younger signers.

5.3.2 The X X’ pattern of doubling: clarification

One of the common types of doubling can be described by the scheme X X’ (X). In this type, the second occurrence of the sign appears immediately after the first one but usually, the second occurrence is different from the first one because it clarifies or specifies the first occurrence. This pattern is quite common in the data: we found 20 cases for RSL (11% of the data) and 34 for NGT (12% of the data).

One phenomenon that is common in RSL but not attested in the analyzed NGT data is fingerspelling of the sign. The sign is first produced in its lexical form, then fingerspelled, as illustrated by the following two examples. In (7a) the sign SNOWBALL is clarified in the same manner, in (7b) the sign BASKET is clarified by fingerpelling the Russian word *korzina* ‘basket’. Note that in (7b), the lexical form of the sign is repeated after the fingerspelled form; this example thus illustrates the pattern X X’ X.

- (7) a. BOY OTHER BOY CL:THROW SNOWBALL S-N-E-Ž-O-K CL:THROW [RSL-z3-7]
 ‘Another boy threw a snowball.’
 b. IX BASKET K-O-R-Z-I-N-A BASKET CL:STAND [RSL-g1-1]
 ‘Three baskets stand down there.’

⁵⁸ This example also contains doubling of the verb CL:GO, which is not discussed here.

One action can be described by two verbs adjacent to each other. Both verbs contribute to the description of a single event, as in (8).

- (8) a. IX BIRD CL:FLY-AROUND(entity) CL:FLY(body-part) [RSL-sh1-s3]
 ‘The birds fly around.’
 b. CL:GO(entity) CL:GO(body-part) [NGT-208-12]
 ‘I go.’

In the RSL example (8a) the first classifier construction contains an entity classifier while the second construction contains a body-part classifier depicting the wings of the birds. A similar example from NGT with the same types of classifiers is provided in (8b). For other sign languages, similar constructions have been analyzed as SVCs (ASL: Supalla 1990; LSQ: Benedicto, Cvejanov and Quer 2008).

A clause can also be repeated, whereby the second clause usually includes some additional or alternative information. In (9, repetition of example (4)), for instance, the reference of the noun OLD.MAN is clarified by the noun phrase FRIEND in the doubled clause, as there was a friend of the main character already active in the story. As pointed out in section 5.2.3, this type of doubling is called an echo.

- (9) OLD.MAN CL:TAKE. FRIEND CL:TAKE [RSL-so2-7]
 ‘The old man took [it], the friend took [it].’

As already mentioned, the X X’ pattern may not reflect a grammatical mechanism, but rather constitute a production-related phenomenon. Fingerspelling of a sign can occur when signers are themselves uncertain about the lexical sign for a referent or when they are unsure whether the addressee will know the sign. For instance, in (7) both the sign BASKET and the sign SNOWBALL can be described as size-and-shape specifiers (Zwitserslood 2013), and therefore as belonging to the productive lexicon and not having the fixed lexical meaning reflected in the glosses. In other cases the signer might use a non-standard variant of a sign that the addressee might not know. Clause repetition with clarification, on the other hand, results from production errors (section 5.2.3). Verbal sequences as in (8), however, are probably not related to production errors.

5.3.3 The X Y X(’) pattern of doubling

The type of doubling which appears most frequently in both the RSL and NGT data – and actually the type most frequently discussed for other sign languages – follows the X Y X(’) pattern, where the occurrences of the doubled constituent are separated by some other constituent. Whether the occurrences are identical or not is a separate question and will be discussed in section 5.3.4. The RSL corpus contains 146 such cases (78% of all doubling), and the NGT corpus 220 cases (77% of all doubling).⁵⁹

We have checked whether there is a significant difference in the frequency of this pattern between RSL and NGT. For this, we compared only the retellings of the Canary Row cartoons in both languages, as they are comparable in terms of content. The relative frequency of doubling was computed by dividing the number of instances of doubling of this type by the

⁵⁹ The percentages from this and the previous sections do not always add up to 100%. This results from the fact that there are some problematic cases that cannot be easily classified. These problematic cases are also reflected in Table 5.5 in section 5.3.5.

number of glosses for the right hand.⁶⁰ It turned out that RSL and NGT have almost exactly the same frequency of doubling construction of this type: 5,6 instances per 100 glosses in RSL and 5,5 instances per 100 glosses in NGT. Therefore, this pattern is equally common in the two languages. As discussed further in section 5.3.3.3, the types of constituents that can be doubled are similar in RSL and NGT as well, but the distribution of types is not.

In the following sub-sections, we discuss different subtypes of the X Y X(′) pattern, first clause-internal doubling (5.3.3.1), then clause doubling (5.3.3.2), and finally the differences between RSL and NGT with respect to these two subtypes of doubling (5.3.3.3).

5.3.3.1 Clause-internal doubling

When doubling of the X Y X(′) type occurs clause-internally, it is usually the predicate that is doubled, while some dependent constituent separates the two occurrences – be it an object (10a-b), a subject (10c-d), or an adverb (10e-f). This type of doubling is the most common one in RSL: there are 91 instances (49% of all doubling), while in the NGT data, it is less frequent: 59 instances (21% of all doubling).

- | | | | |
|------|----|--------------------------------------|--------------|
| (10) | a. | LOOK G-R-U-Š-A LOOK | [RSL-g2-2] |
| | | ‘He looks at the pears.’ | |
| | b. | ONE BRING SCHOOL BRING | [NGT-170-9] |
| | | ‘At 1 I brought her back to school.’ | |
| | c. | THEN CL:DRIVE SOMEONE CL:DRIVE | [RSL-z2-4] |
| | | ‘Then someone is driving a car.’ | |
| | d. | NICE EVERYTHING NICE | [NGT-208-11] |
| | | ‘Everything is nice.’ | |
| | e. | IX GIRL CL:STAND STILL CL:STAND | [RSL-x2-6] |
| | | ‘The girl is still standing.’ | |
| | f. | COLD A.BIT COLD | [NGT-208-12] |
| | | ‘It was a bit cold.’ | |

In addition, in NGT in two cases the subject is doubled while the whole verb phrase is placed in between the occurrences (11). In RSL this type of doubling was not found, but this does not exclude the possibility that it exists.

- | | | |
|------|---|---------------|
| (11) | IX MONKEY MUSIC DANCE JUMP MONKEY | [NGT-1775-73] |
| | ‘There is a monkey dancing to the music.’ | |

Furthermore, in both sign languages, nouns can be doubled with an adjective appearing in between, as shown in (12a-b) by the sequences BOY OTHER BOY and FOREST BEAUTIFUL FOREST. Wh-words may also be doubled in clause-initial and clause-final position (12c-d).

- | | | | |
|------|----|--|------------|
| (12) | a. | BOY OTHER BOY CL:THROW SNOWBALL S-N-E-Ž-O-K CL:THROW | [RSL-z3-7] |
| | | ‘Another boy threw a snowball.’ | |
| | b. | FOREST BEAUTIFUL FOREST AROUND | [NGT-92-2] |
| | | ‘There is a beautiful forest around.’ | |

⁶⁰ Since hands are glossed independently, it is not possible to realistically estimate the number of signs. All but one NGT signer (signer 1) are right-handed. Hence, it has been chosen to use glosses of the right hand for this measure.

- c. WHERE SELL HAT WHERE [RSL-sh1-3]
 ‘..., where they sell hats.’
- d. WHY PANIC WHY [NGT-208-11]
 ‘Why the panic?’

In addition, modal verbs can also be doubled in RSL and NGT, with the rest of the clause being placed in between the two occurrences (13).

- (13) a. WANT STREET WALK WANT [RSL-z1-3]
 ‘He wants to go for a walk on the street.’
- b. MAY.NOT CAT DOG ENTER MAY.NOT [NGT-2074-84]
 ‘Cats and dogs may not enter.’

In NGT yet another kind of doubling exists, namely topic copying (already discussed in section 3.3.1.2).⁶¹ According to previous research, many sentences in NGT contain a pronoun in sentence-final position referring back to the topic of the sentence (Crasborn et al. 2009). The topic itself can be either pronominal or a full NP, and both situations can be analyzed as doubling, but in the NGT corpus used here, only the former occurred, that is, in all instances of topic doubling, a pronoun was doubled.

In NGT pointing signs referring to topical NPs occur rather often in sentence-final position. The corpus of NGT analyzed here includes 43 instances of topic copying (15% of all doubling in NGT) (14).

- (14) IX-1 STILL IX-1 [NGT-94-1]
 ‘I’m still.’

In the RSL corpus, this phenomenon does not occur. Although the corpus is rather small, it is unlikely that the total absence of this phenomenon is accidental. Rather, we take it to suggest that this kind of doubling does not occur in RSL or is very rare. However, this should be checked in future work.

In addition, pointing signs can be doubled within noun phrases in both languages, so that a noun is both preceded and followed by a pointing sign (15).

- (15) a. IX-a CARTOON IX-a [RSL-cr1-10]
 ‘There is a cartoon...’
- b. IX-a CAGE IX-a [NGT-210-11]
 ‘In a cage.’

Most of the instances of doubling discussed above involve doubling of a head (verbal or nominal) with dependents placed in between the occurrences.⁶² However, we have seen that subjects and topics can be doubled as an exception to this rule. There are also a few instances

⁶¹ Some topics can be analyzed as clause-external (see chapter 3), and this also might be true for sentence-final topic copies, so strictly speaking topic-copying might not be clause-internal. However, in this chapter clause-internal vs. –external opposition is used to distinguish between clause/sentence-level phenomena (in other words, syntactic doubling) and discourse-level phenomena, when whole clauses are doubled. Therefore, topic-copying falls under the former category.

⁶² Note that the opposition discussed here is between head and dependent: for instance, within a noun phrase Noun – Adjective – Noun pattern vs. Adjective – Noun – Adjective pattern, not between head and phrasal doubling as discussed in Petronio (1993).

of doubling, both in RSL and NGT, where the doubled element is an adjective or an adverb (16).

- (16) a. SMALL BOY SMALL WINDOW LOOK [RSL-z1-3]
 ‘A small boy looks out of the window.’
 b. IX-1 ALSO CALM DRINK CALM [NGT-208-1]
 ‘I also drank calmly.’

5.3.3.2 Clause doubling

Both in RSL and NGT, clauses can be doubled, and sometimes the occurrences of the clauses are separated by another clause (17). Thus, clause doubling can be said to occur in accordance with the X Y X(′) pattern, although the X X(′) pattern is attested as well (see also section 5.4.3.4). Clause doubling is relatively common both in RSL and NGT. In RSL we found 22 instances of clause-doubling within this pattern (12% of all doubling) and in NGT 59 instances (21%).

- (17) a. CL:FALL. HAT CL:FLY.AWAY. CL:FALL [RSL-g2-2]
 ‘He fell and his hat flew away.’
 b. BE.STARTLED. SCREAM. BE.STARTLED. [NGT-4-2]
 ‘He is afraid and he screams.’

In this construction, the doubled clause and the clause which appears “sandwiched” between the two occurrences may be in different types of semantic relations. In (17) above the clauses in between express the result of the situation described in the doubled clauses (his hat flew away because he fell; he screamed because he was startled). Quite often the clause in between describes a situation that occurs simultaneously with the situation in the doubled clause. For instance, in (18a) the cat ponders and goes back and forth simultaneously. In (18b) the cat comes down (the stairs) while carrying the suitcase.

- (18) a. PONDER. GO.BACK.AND.FORTH. PONDER⁶³ [NGT-1718-71]
 ‘He [the cat] ponders going back and forth.’
 b. IX CL:CARRY. CL:COME.DOWN. CL:CARRY⁶⁴ [RSL-cr5-12]
 ‘He [the cat] comes down carrying [the cage].’

In addition, the clause in between can express the cause of the situation described in the doubled clause. For instance, in (19) the reason for the cat rolling down the street is that he has a ball in his belly.

- (19) CL:ROLL. CL:BALL.IN.BELLY. CL:ROLL [NGT-2076-84]
 ‘He [the cat] rolls down because he has a ball in his belly.’

⁶³ This can also be analyzed as verb doubling and as a type of serial verb construction; this issue is further discussed in section 5.4. However, for the quantitative part of the analysis all cases when instances of a doubled verb were separated by another verb (V V2 V) were analyzed as clause doubling.

⁶⁴ Note that the clauses do not have to be identical either, as in this example. This is further discussed in section 5.3.4.2.

Finally, the clause in between can be a parenthetical comment to the doubled clause. In (20) the signer comments on his doubled utterance which mentions one of the buildings saying that the other building will also later appear in the story.

- (20) IX-a BUILDING CAT BUILDING. IX-b OTHER WAIT. BUILDING [NGT-2076-84]
 ‘There is a cat in one of the buildings. As for the other one, wait. So he is in one of the buildings.’

5.3.3.3 Differences in distribution between RSL and NGT

There is a difference in the frequency of different subtypes of the X Y X(′) pattern between RSL and NGT. We have seen that in RSL verbal doubling is the most common subtype, while in NGT, it is clause doubling. Again, in order to allow for a valid comparison, we have considered only the distribution of different types of X Y X(′) doubling in the Canary Row retellings. The distribution is summarized in table 5.4 below:

Table 5.4. Different subtypes of the X Y X(′) pattern in RSL and NGT retellings of Canary Row

	V	Clause	N	Other	Total
RSL	63 (65%)	14 (14%)	12 (12%)	8 (8%)	97
NGT	39 (32%)	50 (41%)	12 (10%)	20 (17%)	121

The difference between the two languages is highly significant (Pearson’s $\chi^2=28.7461$, $df=3$, $p=2.532e-06$, Cramer’s $V=0.36$, so the effect size is moderate). This table confirms that in RSL verbal doubling is predominant, while in NGT clause doubling is more common than verbal doubling. In addition, the category *Other* is larger in NGT because of the topic doubling construction, which is not attested in RSL.⁶⁵ We will offer an explanation for the difference in frequency of verbal and clause doubling in section 5.4.3.

5.3.4 Identical and modified copies

In the case of the X X′ pattern, the occurrences of the doubled constituent are different by definition. Whenever a constituent is repeated with no difference between the occurrences and no intervening material (i.e. the X X pattern), we are usually dealing with a case of hesitation. However, in the X Y X(′) pattern, the occurrences of X can either be identical or different.

5.3.4.1 Identical doubling

Let us first look at the identical cases. Remember that the RSL corpus contains 146 instances following the X Y X pattern; in 93 of these (i.e. in 64% of this pattern), the two occurrences were identical. In the NGT corpus, 158 cases out of a total of 220 (72%) were identical. In both sign languages, the cases of identical doubling involved various types of doubled elements: verbs (21a-b) (including modal verbs (21c)), adverbs (21d-e), nouns (21f-g), adjectives (21h), and clauses (21i-j). As for topic doubling, all the NGT cases involved identical copies (14).

⁶⁵ Studying Pearson residuals confirm the described differences.

- (21) a. MEET IX POSS-A FRIEND MEET [RSL-so2-7]
 'He met his friend.'
 b. FEAR OF IX BEAR FEAR [NGT-92-2]
 'He was afraid of the bear.'
 c. PROHIBITED HERE CL:SLEIGH PROHIBITED [RSL-z1-3]
 'It is prohibited to sleigh here.'
 d. HOME(ADV) CL:GO HOME(ADV) [RSL-z1-3]
 'He went home.'
 e. IX-1 ALSO CALM DRINK CALM [NGT-208-11]
 'I also was drinking calmly.'
 f. SUDDENLY WIND STRONG WIND [RSL-sh1-3]
 'Suddenly there was a strong wind.'
 g. FOREST MUCH FOREST [NGT-93-1]
 'There's a lot of forest around.'
 h. SMALL BOY SMALL WINDOW LOOK [RSL-z1-3]
 'A small boy looks out of the window.'
 i. CL:FALL. HAT CL:FLY.AWAY. CL:FALL [RSL-g2-2]
 'He fall and his hat flew away.'
 j. BE.STARTLED. SCREAM. BE.STARTLED [NGT-4-2]
 'He is afraid and he cries.'

5.3.4.2 Modified doubling

In the remaining cases, the occurrences were not identical, that is, we are actually dealing with an X Y X' pattern. In the case of clause-internal doubling, the second occurrence is usually more marked or more specific in meaning. For instance, the second occurrence of the verb can be marked with a meaningful (emotional) facial expression (22).

- face: doubtfully
- (22) LOOK G-R-U-Š-A LOOK [RSL-g2-2]
 '[He] looked at the pear doubtfully.'

In addition, in doubled classifier constructions, the two occurrences of the predicate may differ in the shape of the movement; in particular, the second occurrence can be characterized by a more iconic, detailed movement (23).

- (23) LIPSTICK CL:PAINT LIPSTICK CL:PAINT(detailed) [RSL-x3-8]
 '[He] painted with a lipstick.'

This example, as well as several other examples in RSL and NGT, involves role shift during the second occurrence of the verb. However, in general, role shift between the two occurrences of the doubled constituent is not frequent.

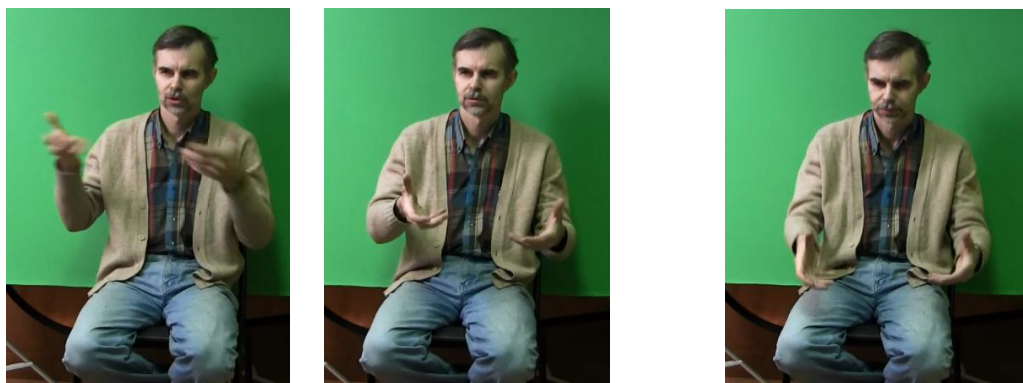
In several cases in RSL and NGT, the second occurrence of a verb carries aspectual inflection such as progressive (24a-b). Sometimes the second occurrence was marked with a distributive marker (24c).

- (24) a. CLOSE / CL:GO THERE CL:GO-ASP.CONT [RSL-g1-1]
 'There he is going now.' (progressive meaning)

- b. LOOK WINDOW IX PLANE LOOK-ASP.CONT [NGT-94-1]
 ‘He looks out of the window of the plane.’
- c. THREE GRATEFUL CL:GIVE / THREE CL:GIVE-ASP.DISTR⁶⁶ [RSL-g2-2]
 ‘[He] gratefully gave three [pears] to three [boys].’ (distributive meaning)

Yet another difference in verbal doubling is observed when the two occurrences of the verb are different in movement because they express different phases in the action described by the verb. For instance, in (25) the signer describes the cat bringing the box and putting it on the street. If we look at the two occurrences of the verb (figure 5.1), in particular the height of articulation, it becomes clear that the first one describes the initial stage of the action *put*, while the second one describes the final stage, placing it on the ground.

- (25) BOX CL:PUT1 STREET CL:PUT2 [RSL-cr6-19]
 ‘He puts the box on the street.’



CL:PUT1(begin and end points)

CL:PUT2

Figure 5.1 Two occurrences of CL:PUT in example (25).

It is possible to argue that such examples do not in fact involve doubling because the occurrences of the verb have different referents, that is, different stages of one event. On the other hand, both occurrences refer to the same general event; therefore in this chapter such examples are analyzed as doubling.

When considering characteristics of signs other than verbs, it can be observed that the two occurrences of a sign can also differ in some phonological aspect such as location (26a) or movement (26b). In (26a) the signer first signs WATER in a neutral location, while the second occurrence is signed lower (depicting the real-world location of the water). In (26b) the first occurrence of the sign NEVER.MIND is signed to the right, while the second is signed in neutral space. In the gloss, we mark these phonological differences by means of an apostrophe.

- (26) a. WATER IX WATER' [NGT-93-1]
 ‘There’s water below.’
- b. NEVER.MIND IX NEVER.MIND' [NGT-208-11]
 ‘It does not matter.’

⁶⁶ The first sign THREE refers to the themes (pears), while the second sign THREE refers to the recipients (boys).

Sometimes the occurrences of the signs are different lexemes, as is true for the two signs meaning ‘whole’ in (27). In this case, it is not possible to tell whether one lexeme is more specific in meaning than the other; rather they might be synonyms. Note that such examples are extremely rare and they constitute a marginal type of doubling with the X Y X’ pattern.

- (27) WHOLE1 BOY WHOLE2 DIRTY [RSL-z3-7]
 ‘The boy is all dirty.’

When clause doubling occurs, the second clause can contain a different number of overtly expressed arguments. Usually, in this case, the second clause contains fewer arguments than the first one (28).

- (28) BOY CRY. CL:FALL. CRY [RSL-x2-6]
 ‘The boy cries because he has fallen.’

5.3.4.3 *Phonetic differences*

When the two occurrences of a doubled constituent differ in some respects, for instance, when one of them is marked for aspect while the other one is uninflected, it comes as no surprise that they are not identical in length either. For instance, a verb marked with continuous aspect, manifested by a repetition of movement, will always be longer than its unmarked counterpart.

However, if we look only at doubling involving identical occurrences, the copies are still not always completely identical, because in many cases, one of the occurrences is shorter and weaker in articulation than the other. Thus, one of the occurrences is made in the phonetically stronger form, while the other can be articulated at a lower location,⁶⁷ with a shorter movement, and/or laxer handshape(s), and it can also be shorter in duration.⁶⁸ In addition, while one of the occurrences may be two-handed, the other can be one-handed. For instance, in (29) the first occurrence of the sign CHAT contains larger and longer movements than the second one. The video stills in figure 5.2 give an impression of the difference in the amplitude of the movement (note that phonetic differences are not marked in the gloss).

- (29) IX-1 AREA CHAT NICE CHAT [NGT-208-12]
 ‘So we chatted nicely.’

⁶⁷ We do not know whether the location change should better be characterized as lowering or moving towards the neutral space. All the signs analysed here were lowered, but we did not have any signs in which the lexical location is below the neutral signing space, for which one might expect not a lower, but a higher (and therefore more neutral) location.

⁶⁸ We consider these differences phonetic because they do not involve differences in contrastive handshapes, movements or locations. The lexical meaning of the sign is not changed when it is articulated in a laxer manner.



a. CHAT (first occurrence)

b. CHAT (second occurrence)

Figure 5.2. Occurrences of the sign CHAT in (29)

We consider all these properties of one of the occurrences to be instantiations of weaker articulation, as all of them are characterized by less muscle involvement and thus less effort. Note that stress or focus marking in sign languages usually manifests itself in the opposite tendency: stressed signs tend to be articulated at a higher location than normal, to have larger movement, and to involve more muscle tension (Crasborn and van der Kooij 2013; also see chapter 4).

In RSL, out of 93 cases of identical doubling, the first occurrence was phonetically stronger (that is longer, having a larger amplitude or higher location) in 59 cases (63%); in 25 cases (27%), the occurrences were of equal strength, while in only 9 cases (10%) the second occurrence was stronger. In the 158 instances of identical NGT doubling, the first occurrence was stronger in 69 cases (44%), the second occurrence was stronger in 25 cases (16%), and in 64 cases (40%), the occurrences were of equal strength. Thus the general tendency is clear: in both sign languages, the first occurrence is usually stronger than the second one. The higher percentage of identical occurrences in NGT is explained by the presence of topic copying: when pointing signs are doubled, the two occurrences are usually equally long.

When clauses are doubled, the second occurrence is also usually shorter. Moreover, the tendency observed in section 5.3.4.2, namely that arguments are overtly expressed in the first clause but not in the second, may be an instantiation of the same phenomenon at the clause level. A possible explanation for the difference in strength of articulation between the occurrences will be discussed in section 5.4.

5.3.4 Prosody of doubling

The final aspect to consider is prosody. This is an important issue, as some researchers might consider only those cases of clause-internal doubling as the core cases in which the occurrences of the doubled constituent are not separated by a prosodic boundary (that is, belong to the same prosodic unit). What motivates this concern is that a prosodic boundary can be caused by a syntactic (clause) boundary, so that apparent cases of clause-internal doubling might in fact involve multi-clausal constructions.

In order to investigate this issue, prosodic boundaries were established using the definitions introduced in chapter 3. Looking at the corpus data, the main conclusion is that (clause-internal) doubling in most cases involves a prosodic boundary between the two

occurrences of the doubled constituent both in RSL and NGT. Even in the cases of identical verb doubling, this is the main pattern (30).

- (30) a. MEET / IX POSS-a FRIEND / MEET⁶⁹ [RSL-s2-7]
 ‘He met his friend.’
 b. CL:TAKE / NAPKIN / CL:TAKE [NGT-208-12]
 ‘I took the napkin.’

Conversely, even in the case of clause doubling, where one would clearly expect a prosodic boundary, sometimes there is none (31):

- (31) WAS CASE. WAS CASE [RSL-x3-8]
 ‘There was a case.’

If we look at the most frequent pattern of doubling, the X Y X(’) pattern, we find all possible positions for prosodic boundaries in both languages, namely X / Y X (32a-b) (common); X Y / X (32c-d) (less common); X / Y / X (30) (common), and X Y X (32e-f) (no boundaries, common).

- (32) a. STEAL / LIPSTICK STEAL [RSL-x3-8]
 ‘He stole the lipstick.’
 b. IX-1 LOOK / CONCEALED LOOK [NGT-93-1]
 ‘I look concealed.’
 c. CL:HOLD G-R-U-Š-A⁷⁰ / CL:HOLD [RSL-g1-1]
 ‘They walk with pears in their hands.’
 d. ... IX-1 MUST GO BIRTHDAY / GO [NGT-170-10]
 ‘... I had to go to a birthday party.’
 e. LEAVE SHOP LEAVE [RSL-sh1-3]
 ‘[He] left the shop.’
 f. BRING HALF 4 BRING [NGT-170-9]
 ‘[I] brought [her] at half 4.’

Topic doubling does not show the variety of prosodic patterns described above. As topic doubling involves pointing, the occurrences mostly are not separated from the rest of the sentence by any boundaries (33a). However, there are a few cases in which the first occurrence of the topic is separated by a pause (33b), and there is at least one case in which the second occurrence of the topic is separated by a pause and a head movement (33c).

- (33) a. IX-1 DARE IX-1 [NGT-4-3]
 ‘I dare it.’
 b. IX-a / RED IX-a [NGT-94-1]
 ‘She is red.’
 c. IX-1 DO WHAT / IX-1 [NGT-208-11]
 ‘What did I do?’

Note also that there is individual variation in the number of prosodic boundaries. For instance, the doubling structures produced by one of the RSL signers do not involve prosodic

⁶⁹ Note that prosodic boundaries are consistently marked only in this section.

⁷⁰ Russian word ‘pear’ fingerspelled.

boundaries in most cases, including complex sentences with doubling of modal verbs as in (34).

- (34) WANT HAT NEW BUY WANT [RSL-sh1-3]
 ‘He wanted to buy a new hat.’

To sum up, in RSL and NGT the occurrences of the doubled constituent are usually separated by a prosodic boundary, although we also find many cases in which they are not prosodically separated. It is therefore not possible to claim that only doubling without prosodic boundaries would constitute the core case and that cases involving a prosodic boundary should be excluded (or at least analyzed separately). In addition, at this stage of investigation, it is not possible to pin down the exact factors responsible for the presence or absence of prosodic boundaries between the occurrences of the doubled constituent.

5.3.5 Summary

In the previous sub-sections, doubling structures in RSL and NGT have been categorized into different characteristic patterns. Table 5.5 provides an overview of the three basic patterns (plus unclear cases) and also shows the distribution of the doubling cases across the different patterns of doubling in RSL and NGT.

Table 5.5. Patterns of doubling in RSL and NGT in raw numbers and percentages

Pattern of doubling		Number of cases			
		RSL		NGT	
X X pattern		11	6%	29	10%
X X' pattern		20	11%	34	12%
X Y X(') pattern	Clause-internal doubling	124	67%	161	56%
	Clause doubling	22	12%	59	20%
Unclear cases		9	5%	4	1%
Total		186		287	

As can be seen from the table, the most frequent pattern of doubling in both languages is the X Y X pattern. In the next section, we present a possible analysis of doubling in RSL and NGT that allows for a unified account for this pattern of doubling.

5.4 Functions of doubling

In this section, we address the question why doubling in RSL and NGT occurs. More specifically, the aim of the section is to uncover the function of doubling in these languages. Obviously, doubling as a result of hesitation (X X) or as a means of clarification (X X') is not discussed here, as these patterns do not constitute grammatical phenomena in the strict sense; also the motivation for these patterns is rather clear. Therefore only the X Y X(') pattern of doubling is discussed.

Firstly, possible morphosyntactic motivations for doubling previously offered for other sign languages are discussed (section 5.4.1). Then emphasis as one of the functions of

doubling is analyzed in section 5.4.2. Finally, based on the insights from Shamaro (2008), a pragmatic explanation of doubling in RSL and NGT is offered in section 5.4.3.

5.4.1 Morphosyntactic motivation

As discussed in section 2.4, for some of the doubling phenomena, morphosyntactic explanations have been offered. The following three proposals have been made in the literature:

1. Doubling occurs when the predicate is “too heavy”, in other words, when it is marked for aspect or contains a classifier and also an object of the verb is present (Fischer and Janis 1990), as in (35a-b).
2. Doubling results from limitations on argument incorporation (Kegl 1985). Classifiers predicates can incorporate two arguments at the most, so if three arguments need to be incorporated, doubling is used, as in (35c).
3. Doubling occurs when the verb is intransitivized due to the presence of an aspect marker (again, as in (35a-b)) and therefore cannot have an overt object expressed in the same sentence with it (Liddell 2003). This proposal is closely related to that of Fischer and Janis (1990).

- (35) a. S-H-E LISTEN R-A-D-I-O LISTEN^[asp: cont] [ASL]
 ‘While she is listening to the radio...’ [Fischer and Janis 1990:281]
- b. ELIZABETH EAT R-I-C-E EAT-WITH-CHOPSTICKS [ASL]
 ‘While Elizabeth is eating her rice with chopsticks...’ [Fischer and Janis 1990:284]
- c. CL:HIT-PERSON, 3-CL:FLAT.OBJECT-HIT.IN.HEAD [ASL]
 ‘Hit someone in the head’ [Kegl 1985]

The first and third explanations are in principle applicable to a number of examples from both RSL and NGT in which the second occurrence of the doubled verb is marked for aspect (36). Examples parallel to ASL (35c) are attested in RSL and NGT as well, but they have not been found in the data analyzed here.

- (36) a. CLOSE / CL:GO THERE CL:GO-ASP.CONT [RSL-g1-1]
 ‘There he is going now.’ (progressive meaning)
- b. LOOK WINDOW IX PLANE LOOK-ASP.CONT [NGT-4-1]
 ‘He looks out of the window.’

However, as Shamaro (2008) has shown for RSL, these explanations are not relevant when the occurrences of the doubled element are identical, because in this case, the two occurrences do not differ in heaviness and neither of incorporates an argument that the other does not. Moreover, the verb that is doubled is sometimes not inflected or does not contain a classifier at all (37).

- (37) a. PROHIBITED HERE CL:SLEIGH PROHIBITED [RSL-z1-3]
 ‘It is prohibited to sleigh here.’
- b. FEAR OF IX BEAR FEAR [NGT-92-2]
 ‘He was really afraid of the bear.’

In addition, these explanations only apply to verbs. We have seen, however, that not only verbs can be doubled, but all kinds of elements including clauses. Even if clauses are excluded from analyses as a discourse-level phenomenon, doubling of nouns or adverbs or

adjectives cannot be described in the terms discussed above. Nevertheless, we leave open the possibility that verbal doubling with aspectual marking present on the second instance of the doubled verb (as in (36)) can be explained in line with Fisher and Janis (1990) or Liddell (2003).

5.4.2 Emphasis and doubling

In both signed and spoken languages, doubling can be used to express emphasis. In RSL and NGT, we find some examples that seem to involve emphasis on the doubled constituent. We define emphasis as the category that expresses the surprise of the speaker at the fact that some low-ranked (that is, unlikely) alternative is true (Krifka 2008). For instance, in the English sentence “Even Peter came” the emphasis (expressed by the particle *even*) means that Peter is the least likely person to have come, but he did indeed come. Thus, for similar examples in RSL and NGT, an analysis in the spirit of Nunes and de Quadros (2008) could be offered.

We suggest that emphasis can be a motivation for the doubling of modal verbs in RSL (38a) and for the doubling of quantifiers (38b-c) and wh-words (38d) in both languages. For instance, in (38a) the emphasis arises because the character cannot grab the pear despite the fact that he tries hard. In (38b) the chance that the *whole boy* gets dirty is a low-ranked alternative (it would be more likely that only some part of the boy gets dirty), and in (38c) the chance that the bag including *all clothes* low-ranked because it is more likely that only some things were closed inside. In (38d) the signer emphasizes that there was really no reason for panic.

- | | | |
|------|--|--------------|
| (38) | a. CANNOT CL:GRAB CANNOT
‘He cannot grab it.’ | [RSL-g2-2] |
| | b. WHOLE1 BOY WHOLE2 DIRTY
‘The boy is all dirty.’ | [RSL-z3-7] |
| | c. THIRDLY BAG ALL CLOTHES ALL IN
‘Thirdly, there was a bag with all clothes’ | [NGT-208-12] |
| | d. WHY PANIC WHY
‘Why the panic?’ | [NGT-208-11] |

In some examples, the context and the prosodic properties also suggest emphasis, as in (39), where the non-manuals emphasize the high degree of fear felt by the character.

- | | | |
|------|---|------------|
| | <u>intense fear</u> | |
| (39) | FEAR OF IX BEAR FEAR
‘He was really afraid of the bear.’ | [NGT-92-2] |

However, in both languages, these examples constitute a minority, while most examples (including most of the examples discussed in section 5.3) cannot be reasonably considered emphatic. Therefore, although emphasis might motivate some of the occurrences of doubling, it certainly cannot explain all of them.

5.4.3 Pragmatic explanation

The previous two sections have shown that analyses of doubling offered in the literature can only explain a small subset of cases attested in RSL and NGT. In this section, an account of doubling in RSL and NGT is presented based on Shamaro’s (2008) insights on doubling in

RSL (section 5.4.3.1), but is developed further to also account for other RSL and NGT phenomena (sections 5.4.3.2-5.4.3.4). The current proposal can be seen as a unified explanation for doubling in RSL and NGT.

5.4.3.1 *The one new idea constraint*

Shamaro (2008) investigated verbal doubling in RSL and came to the conclusion that the phenomenon in general cannot be attributed to morphosyntactic factors. Instead she offered an alternative explanation based on pragmatics. She noticed that in all cases, the material intervening between the occurrences of the doubled element was new information. With few exceptions, this observation is also true for the RSL and NGT data analyzed here. Based on her observation, Shamaro suggested that doubling is motivated by a limitation on the amount of new information. Based on Chafe (1994), she claimed that one discourse unit can express one new idea. When both the predicate and the object of the predicate are new information, they should be placed in separate discourse units. This is achieved, according to Shamaro, by dislocating the object into the post-verbal position yielding the V / O order, where the verb and the object belong to separate discourse units. The verb is then repeated to return the focus of attention to the predicate, a strategy which helps to maintain cohesion of the discourse, yielding the V / O V order. Note that in the second discourse unit only the object is new information, while the verb has already been mentioned; therefore, the one new idea constraint is obeyed.

Several objections can be raised to this proposal. Firstly, according to previous research (Kimmelman 2012a), the VO order is unmarked, at least for plain verbs in RSL. Shamaro herself acknowledges that the verb is not always repeated in the case of the VO order. Secondly, Shamaro's explanation is not sufficient to also account for the cases of clause doubling. Thirdly, it cannot account for topic doubling in NGT, as topics are (mostly) old information – therefore, a presence of a topic would never violate the one new idea constraint, and doubling of the topic would be unnecessary. Finally, the claim that the two portions of new information (the verb and the object) in the VO order belong to separate discourse units was not demonstrated by Shamaro (2008). In the data analyzed here, in verbal doubling the first occurrence of the verb and the object often belong to the same prosodic unit.

To sum up, Shamaro's explanation is not entirely satisfactory because it involves the interaction of syntax and pragmatics, and the syntactic part of the story does not appear justified. However, the pragmatic motivation is on the right track, since it can account for a majority of the RSL and NGT examples analyzed here if modified slightly, as will be shown in the next section.

5.4.3.2 *Foregrounding and backgrounding*

We suggest that instead of old/new information, the notions of *fore-* and *backgrounding* should be used to account for doubling in RSL and NGT (Foley and Van Valin 1985).⁷¹ The speaker foregrounds the information that s/he considers most important for the hearer, and backgrounds the information that bears less importance. In other words, foregrounding information increases its saliency (Wilbur 1994).

If we suppose that the doubled constituent is foregrounded, while the material placed between the occurrences is backgrounded, then we can explain the following facts observed in

⁷¹ See also Wilbur (1994) on foregrounding in ASL. Also note that these terms should not be confused with Figure/Ground relations in locative constructions.

section 5.3: (1) both new and old information can be doubled; (2) the constituent between the occurrences of the doubling is mostly new information; (3) doubling is used for emphasis; (4) the second occurrence of the doubled constituent is usually phonetically reduced.

Firstly, both old and new information can be foregrounded or backgrounded by the language user (Foley and Van Valin 1985). This makes it possible to account for RSL and NGT doubling.

Secondly, backgrounding is indeed used mostly for new information for reasons discussed by Shamaro (2008): if the new information is not used in further discourse and/or is not relevant for the following discussion, its status may be lowered. This appears to be what is happening: in most cases, the information that is placed between the occurrences of the doubled constituent is not referred to or mentioned again afterwards. In addition, emphasis is functionally related to foregrounding, as the emphasized information is obviously foregrounded. In the case of topic doubling in NGT, one would expect that, if the topic is foregrounded, the following sentence will have the same topic. This expectation is confirmed in most cases too.

Let us consider a couple of examples. In (40a) a new object appears between the occurrences of the verb, namely a stick. This object, however, is not important for the further discussion and is never mentioned afterwards, therefore, it is backgrounded. In (40b) the destination of the train is mentioned, however, this will not be further discussed in the following discourse, hence it is backgrounded.

- (40) a. CL:WAVE STICK CL:WAVE [RSL-sh2-8]
 ‘He waves a stick.’
 b. IX MONITOR GO ROTTERDAM GO [NGT-208-11]
 ‘The monitor says that [the train] goes to Rotterdam.’

Sometimes an adjunct appears between the occurrences of the verb, as in (41). In this case, it is not possible to talk about the activation status of the intervening element, that is, it is not possible to decide whether it is old or new information (remember that according to Shamaro, the adverb should be new information). It is clear, however, that the adverb is never foregrounded; it never constitutes the center of attention of the signer. This is in line with our generalization.

- (41) a. IX GIRL CL:STAND STILL CL:STAND [RSL-x2-6]
 ‘The girl is still standing.’
 b. BRING HALF 4 BRING [NGT-170-9]
 ‘[I] brought [her] at half 4.’

Importantly, this analysis does not only capture instances of verb doubling and topic doubling. For instance, a noun can be doubled with an adjective placed in between the occurrences. Again, the importance of the adjective for the further discourse may be low. For instance, in (42) the fact that the forest was beautiful plays no role in the further story (which is about an encounter with a huge bear in the forest).

- (42) FOREST BEAUTIFUL FOREST AROUND [NGT-92-2]
 ‘There is a beautiful forest around.’

5.4.3.3 Clause doubling and grammaticalization

Clause doubling can be explained along similar lines, the clause-internal and clause doubling having a meaning related through the process of grammaticalization. When we look at the discourse level, there is a chain of events described by a sequence of clauses. Sometimes the signer intentionally or accidentally breaks the chain of events, so that the clause Y that follows clause X describes a situation that does not follow the situation of X temporally or logically. For instance, clause Y can clarify some unclear situation. Subsequently, the signer may want to repeat clause X to return to the chain of events.

In the RSL example in (43), for instance, the signer first signs the clause CAR CL:SPRAY.WATER to describe the situation ‘the car sprayed water over him’. However, no car was mentioned before, so the signer decides that the situation should be clarified by adding the information that there was a car driving. After the clarification, he returns to the storyline by repeating (part of) the first clause.

- (43) CAR CL:SPRAY.WATER. CAR CL:RIDE. CL:SPRAY.WATER [RSL-z1-3]
 ‘The car sprayed water over him. There was a car driving there. So it sprayed water over him.’

In the NGT example (44), the signer first signs the clause ONE WOMAN STARE to convey the situation ‘a woman was staring at us’. Then he clarifies the reason for her staring: she was a hearing person (while the signer and his friends were using sign language). Subsequently, he returns to the story line by repeating (a reduced version of) the first clause. Therefore, both examples fit our generalization: the intervening clause contains backgrounded information.

- (44) ONE WOMAN STARE. HEARING. IX STARE [NGT-208-12]
 ‘One woman stared at us. She was hearing. So she stared.’

Simultaneity expressed by doubling is related to foregrounding as well.⁷² Two actions are described which happen simultaneously, but one of them is more central for the storyline. In (45) the cat ponders and goes back and forth simultaneously, but his pondering is more relevant for the storyline, as it is then told what exactly he has thought up. In order to express a similar relation of fore- and backgrounding in English, the foregrounded clause would be the main clause, and the backgrounded clause subordinate: “The cat ponders (while) going back and forth.” If the foregrounding relations were reversed, one could say “The cat goes back and forth pondering about something”.

- (45) PONDER. CL:GO.BACK.AND.FORTH. PONDER [NGT-1718-71]
 ‘He [the cat] ponders going back and forth.’

Finally, when the clause in between is a parenthetical comment to the doubled clause, the backgrounding of the information it contains is most obvious. Parentheticals in general can be described as backgrounded, supplementary, or not-at-issue information (Potts 2005).

⁷² Note that doubling indeed *expresses* simultaneity: without doubling the events described in the first and second clause of (45) would be interpreted as sequential: the cat ponders, and then he walks around.

Thus, clause repetition is a discourse-level phenomenon that has to do with the storyline and the chain of events; it is a way of coping with disruptions of the chain. We hypothesize⁷³ that clause repetition is the origin of clause-internal doubling (of the form X Y X(?)) in RSL and NGT. In particular, we would like to suggest that clause repetition has grammaticalized into clause-internal doubling partially preserving the function of repairing the storyline.⁷⁴

Both in RSL and NGT, arguments can be covert if they are recoverable from the context. Thus quite often a clause consists of just one verb, which already implies that it is not always possible to distinguish between clause repetition and verb-doubling. For instance, in (46) the doubled sign BE.STARTLED can either be analyzed as a clause or as a verb, while the sign SCREAM can be an embedded clause (which would yield the meaning ‘He screams because of being afraid’). See Stage 1 in table 5.6.

- (46) BE.STARTLED(.) SCREAM(.) BE.STARTLED [NGT-4-3]
 ‘He is afraid and he screams.’

Examples like (46) may give rise to the emergence of clause-internal doubling, because the clause doubling is reanalyzed as clause-internal verb doubling (see Stage 2 in table 5.6). While in examples like (46), the function can still be described as returning to the chain of events after disruption, this pattern is then extended to other types of intervening constituents and finally to other types of doubled constituents.

Table 5.6. Grammaticalization of doubling

	Form			Function	
	Stage 1	Clause-1	Clause-2	Clause-1	Return to the main storyline
	Stage 2	V-1	V-2	V-1	1. Return to the main storyline 2. Foregrounding of the event expressed by V-1
	Stage 3	X	Y	X	Foregrounding of X and backgrounding of Y
	Stage 4	X	Y	X	1. Foregrounding of X and backgrounding of Y 2. Emphasis on X
	Stage 5	X	Y	X'	X Y X(reduced)

At the next stage (Stage 3 in table 5.6), the function of the construction changes to a more general/grammatical one, namely foregrounding of the doubled material. Once this construction has been established, it can also be used for other purposes related to foregrounding, such as emphasis (Stage 4 in table 5.6). Finally, once the X Y X pattern has been conventionalized and become part of the grammar of a sign language, its use can

⁷³ Hypotheses about diachronic development in sign languages are notoriously difficult to prove, as we generally do not have access to any diachronic evidence. Thus this hypothesis can be supported by its explanatory force.

⁷⁴ For a detailed discussion of grammaticalization in sign languages see Pfau and Steinbach 2011, Janzen 2012.

probably be extended to cases of non-identical doubling (Stage 5 in table 5.6). Thus, the foregrounded constituent does not have to be identical anymore, because the signer may decide to further elaborate on its content in the second occurrence. At this stage, doubling for morphosyntactic reasons emerges.

On the other hand, when the occurrences are identical, the second occurrence naturally is phonetically reduced, that is, it becomes less strong in pronunciation, as it is in fact redundant information and thus less important perceptually (Stage 5 in table 5.6). Note that the loss of phonological substance is a general hallmark of grammaticalization (Hopper and Traugott 2003). Following this line of reasoning, most of the properties of the X Y X(′) pattern in RSL and NGT receive a unified explanation. The hypothesized grammaticalization path of doubling in RSL and NGT is summarized in table 5.6.

Recall that NGT has a higher proportion of clause-doubling, while in RSL verbal doubling is more common. It is therefore possible that RSL is located further down the path of grammaticalization of doubling. While in NGT many instances of doubling are discourse-level phenomena, in RSL the majority of instances are used to express a grammaticalized pragmatic function of fore- and backgrounding.

5.4.3.4 Problematic cases

Even if we accept the foregrounding function of doubling in RSL and NGT, some cases still remain problematic. As already discussed in section 4.3.3, in the elicited RSL question-answer pairs, when only the object is in focus, the verb is sometimes doubled. For instance, in (47) the object FATHER is in focus, but the verb KISS is doubled. We cannot establish the function of doubling in this case. We hypothesize that this might be an even further step in the grammaticalization process whereby the pragmatic function of doubling is lost, and is replaced by some morphosyntactic function. However, it is also clear that this kind of examples cannot be explained in terms of “overload” of grammatical information, similar to Fisher and Janis (1990), as the doubling here is identical – further research is needed.

- (47) KISS [FATHER]_{FOC} KISS [RSLf-11-1]
 ‘She kisses her father.’

In addition, in section 4.3.3 we also discussed two RSL examples which contained subject and object doubling expressing subject and object focus correspondingly (48). Again, the foregrounding analysis does not directly apply, because the information between the two copies of the doubled constituent is not new. We do not yet have an analysis for these examples.

- (48) a. [IX CAT]_{FOC} EAT [CAT]_{FOC} [RSLf-32-10]
 ‘No, the cat eats.’ (corrective)
 b. [DOG]_{FOC} MAN CL:HOLD [DOG]_{FOC} [RSLf-3-13]
 ‘The man holds a dog.’ (information)

Another series of examples involves adjective doubling. In (49a) the numeral THREE is repeated with the noun intervening between the occurrences. For the storyline, the number of the boys is relevant; however, so also is the fact that the three persons were boys. Therefore, if the doubled numeral is foregrounded in (49a), as is predicted by our generalization, then it is unclear why. In (49b) the adjective LITTLE is doubled and frames the noun it modifies, although the adjective clearly does not represent the most important information. This

sentence, however, appeared discourse-initially, so doubling of the adjective might be connected to a false start.

- (49) a. IX CLOSE1 CLOSE2 IX THREE BOY OTHER THREE LOOK [RSL-g1-1]
 ‘Not far from there three other boys look [at him].’
 b. LITTLE BOY LITTLE WINDOW LOOK [RSL-z1-s3]
 ‘A little boy looks out of the window.’

The NGT example (50) is reminiscent of example (49a) in that the numeral FOUR is repeated. This instance of doubling, however, might be connected to emphasis, as the signer was probably surprised by the number of policemen coming.

- (50) FOUR TRAIN POLICEMAN FOUR COME [NGT-208-12]
 ‘Four train policemen came.’

Alternatively, examples (49) and (50) might in fact be instances of code-mixing in RSL and NGT. In both languages, the canonical position of adjectival modifiers is post-nominal, while in Russian and Dutch, adjectival modifiers are pre-nominal. Possibly in (49-50), the signer first used the spoken language word order (Adjective – Noun), while repeating the adjective post-nominally as a repair strategy. This hypothesis is also indirectly confirmed by the fact that in (49a) and (50) the first occurrence of the adjective is accompanied with mouthing (signifying a more direct influence of the spoken language), while the second occurrence is not.

In RSL and NGT, a clause was sometimes doubled without modification and the occurrences appeared adjacent to each other (51), thus following the X X pattern.

- (51) IX-1 DRINK. IX-1 DRINK [NGT-208-12]
 ‘I drink.’

In examples like (51), the function of doubling is unclear. In some of these cases, emphasis might play a role, but that is not possible in all of them. Alternatively, it might be the case that this is also an instance of hesitation and that the signer repeats the clause in order to have time to think about the further discourse. This hypothesis is supported by the fact that this kind of clause-doubling often happens at the transitions between episodes.

The final issue discussed here is the case of wh-doubling. In many cases the wh-word is doubled for emphatic reasons. In most of the cases it is possible to claim that the wh-word is foregrounded as it is the most important element in the question. However, as (52) shows, wh-words can be doubled when they are used in relative clauses as well:

- (52) WHERE SELL HAT WHERE [RSL-sh1-3]
 ‘[He goes to a shop], where they sell hats.’

It is not clear whether in cases like (52) the wh-word is foregrounded. It might be the case that this kind of examples is even a further stage of grammaticalization. Doubling of wh-words both in questions and in relative clauses can be used to mark boundaries of the clauses. This path of development, namely, from elements related to focus to markers of (embedded-) clause boundaries has been attested in other languages. For instance, in Tok Pisin (Sankoff and Brown 1976:632) a demonstrative *ia* ‘here’ has a focusing function and a “bracketing”

function, that is, it is also used to mark both the left and the right boundary of a relative clause (53).

- (53) Meri ia [em i yangpela meri, draipela meri ia] em harim istap [Tok Pisin]
 ‘This girl, who was a young girl, big girl, was listening.’ [Sankoff and Brown 1976]

5.5 Discussion

In this section, we will discuss the remaining questions and possible consequences of the analysis presented in the previous section: firstly notional consequences (section 5.5.1), and then an alternative motivation for doubling, namely prosodic motivation, offered by Crasborn, van der Kooij and Ros (2012) (section 5.5.2). Finally, we try to answer the question why doubling is so prominent in sign languages in general, as well as in RSL and NGT in particular, (section 5.5.3). Two possible motivations for doubling are discussed, namely a sociolinguistic motivation (section 5.5.3.1) and a cognitive motivation (section 5.5.3.2).

5.5.1 Notional consequences

If the analysis of doubling in RSL and NGT proposed here is on the right track, it means that the notions of Topic and Focus are not sufficient to describe IS in these languages. Rather, an additional distinction of foregrounded versus backgrounded information is necessary.

Many researchers do in fact acknowledge that topic and focus alone are not sufficient to describe the IS of the whole sentence, because there are often some parts of a sentence that can be neither topic nor focus. Thus sometimes topic is opposed to comment (and not to focus), while focus is opposed to background. As mentioned in section 1.3, Vallduví (1992) claimed that the sentence is divided into focus and background, while background is further divided into link (comparable to topic in the terminology of this dissertation terminology) and tail (elements that are functionally topical but are placed clause-finally). However, this system is still not powerful enough to describe the facts in the sign languages under investigation, because, as we have seen, both topic and focus can be foregrounded and backgrounded, while in Vallduví’s approach, topics are by definition backgrounded.

To sum up, the doubling data from RSL and NGT suggest that, apart from topic and focus, an orthogonal notion of foregrounding should be used to describe IS in these two languages, and probably in other sign languages as well.

5.5.2 Prosody and doubling

Crasborn, van der Kooij and Ros (2012) have argued that topic copying in NGT is at least partially prosodically motivated. In a carefully devised study, they showed that phonological phrases need to end with elements that are heavy in terms of syllable structure. Adding an indexical sign (or another light element, such as the PU sign) at the end of the phrase is one of the ways to make the final element heavy. The question then arises whether this prosodic motivation can actually account for the appearance of the doubled elements in RSL and NGT in general. Although the authors themselves did not claim that prosody is the only motivation for topic copying, we would like to consider both their strong claim, i.e. that prosody is the motivation for doubling in RSL and NGT, and the weaker claim that prosody accounts for only some instances of doubling in RSL and NGT and the implications of these claims for this study.

It is obvious from the results of this study that the strong claim has to be rejected. First, if we look outside the domain of topic copying, the occurrences of the doubled constituent quite often are not prosodically light as individual signs: for instance, aspectually marked verbs are obviously heavy in the terms of syllable structure. Second, if we look at topic copying in NGT, sometimes the second occurrence is not clause-final and not in the final position of an intonation unit. Third, the authors have shown that NGT has several strategies to make a final element in a phrase heavy, namely by adding other light signs such as PU, adding movement to the final sign itself or even adding non-manual expressions when the sign itself cannot be modified. The signer always has a choice to between these strategies, but in some cases s/he chooses to use topic-copying. This choice that is made between the different strategies has to be motivated by some other factor – namely, in the current analysis, by the necessity to foreground the topic.

The weak claim, however, namely that prosody does play a role in doubling processes, both in RSL and NGT, seems to be hard to argue against. Crasborn et al. (2012) have convincingly demonstrated that the final elements in phonological phrases have to be heavy and that topic copying is one of the strategies to satisfy this demand. In principle, not only topic doubling, but also other cases of doubling in RSL and NGT, can have a similar prosodic function when the second occurrence of the doubled element and the preceding sign together form a single phonologically heavy element. The main question is what the relation is between the prosodic function of doubling and the grammatical or pragmatic function of doubling as described in this chapter.

As argued in the previous sections, there are some cases of doubling in RSL and NGT that cannot be subsumed under the prosodic analysis because the doubled element itself is too heavy. It is reasonable to say, therefore, that doubling has a separate pragmatic function, namely foregrounding. Since some examples of topic copying were found when the doubled topic was not referred to again in the following discourse, it is also reasonable to suggest that topic copying sometimes does not have a function of foregrounding but happens for prosodic reasons only. Finally, in the majority of cases of topic copying the two functions co-exist: doubling is used both for prosodic and for pragmatic reasons.

5.5.3 Why is doubling so prominent?

In section 5.4, we have demonstrated that doubling is very prominent in RSL and NGT. It is prominent in two respects: firstly, it is used frequently in normal semi-spontaneous narratives; secondly, doubling can be applied to very different kinds of constituents.

In addition, in section 2.4 we have seen that doubling is also present in many other sign languages. As discussed there, doubling is used in spoken languages as well, although, to our knowledge, it is much more restricted. Most typically, only verbal doubling is present and it is only used in very marked contexts, such as emphatic verbal focus. Although there is no comprehensive research of doubling in sign languages other than RSL and NGT, based on the literature we can suppose that studying naturalistic data will show that doubling in other sign languages is less restricted than in spoken languages.

In this section, therefore, we explore the question why doubling is so prominent in sign languages. We also try to sketch a scenario that explains how doubling appears in a sign language to be then incorporated into the grammatical system. Note that the two explanations offered below are not explanations for particular instances of doubling in RSL or NGT; instead they try to explain the presence and prevalence of doubling in general.

The discussion in this section is purely hypothetical. If future research shows that doubling is in fact not more prominent in sign languages than in spoken languages, the

explanations offered below will become invalid. However, if our presupposition that doubling is especially prominent in sign languages is confirmed in future, the scenarios sketched here may be useful.

5.5.3.1 Sociolinguistic motivation for doubling

The prevalence of doubling in different sign languages and the relative rarity of doubling in spoken languages may be related to the sociolinguistic characteristics of sign languages. They are languages that exist in an unusual situation: at most 10% of deaf children are born to deaf parents, the remaining 90% learn a sign language later as non-native signers. Native signers are also often in conversation with non-native signers. A possible connection to the prevalence of doubling constructions would therefore be the fact that non-native signers have difficulties with perceiving information, so doubling the most important elements in the utterance would be a compensation strategy. We do not want to argue that all instances of doubling are the result of a compensation strategy: obviously many of the instances are grammaticalized constructions. However, the origin of the construction, and also the prevalence of this construction in discourse, might be connected to the compensation of non-ideal perception by the non-native addressees.

Some indirect evidence comes from Nicaraguan Sign Language (NSL) (Senghas, Kita and Özyürek (2004)). Describing the doubling construction of the X Y X pattern in this language the authors noticed that verbs of movement quite often appear in such structures when the path and the manner of movement are split (ROLL DESCEND ROLL). They found this pattern present in the speech of all three cohorts of NSL signers. Cohorts in their definition are groups of signers according to the date when they started learning NSL: the first cohort is the first signers who created a pidgin, the second cohort acquired and transformed their language and the third cohort learned from the second one. In other words, this pattern arose immediately when NSL emerged. They also notice that hearing Spanish-speaking people of the same region do not produce this construction in their co-speech gesture (or in the spoken language). Therefore, this construction did not appear because of contact with Spanish, or because of the gestural origin of NSL. The fact that the doubling construction existed from the start of a sign language, when the language itself does not yet exist, might be an argument in favor of analyzing it as a compensation strategy.

It might be also attractive to compare sign languages to pidgins and creoles in this respect. First, sign languages have earlier been compared to creole languages because of their sociolinguistic situation (Fischer 1978). Second, some creole languages do indeed have doubling (Lefebvre 2004). However, this comparison does not seem valid. To begin with, the explanation outlined above would only work for pidgins, not creoles. Children learning a creole language from their parents would not have any problems with understanding, so no compensation strategy would be necessary. One might suggest that doubling appears in pidgins as such a strategy and then is preserved in creoles as a remnant of the previous stage. However, there are also some objections to this hypothesis. Not all creoles have such structures; Lefebvre (2004) argued it is more likely that creoles that do have doubling structures inherit them from their source languages. Therefore, the explanation that has been offered for sign languages should not apply to creole languages.

5.5.3.2 Cognitive motivation for doubling

It has been shown (Geraci, Gozzi, Papagno and Cecchetto 2008 among others) that short-term memory (STM) span is shorter when signs of a sign language are recalled in comparison to words of a spoken language. Geraci et al. (2008), based on the data from Italian Sign Language and (spoken and written) Italian, convincingly demonstrate that the difference in STM is not an artifact of some external factor (such as the visual method of presentation of the stimuli or deafness per se), but arises because of the difference in modality. Users of a sign language have a limited ability to hold a long sequence of signs in short term memory necessary for processing. Doubling might be a strategy of coping with this limitation in the addressee, as the most important pieces of information are presented to the addressee not once, but twice. This explanation is in line with the pragmatic function of doubling found for RSL and NGT in this chapter.

There is, however, a problem with this explanation. Boutla, Supalla, Newport and Bavelier (2004) analyzed the processing capacity of working memory in sign languages using a signing task involving sentence generation based on a list of words/signs. The signers and speakers were asked to generate one sentence for each sign/word in the list. They found that in this task signers showed no disadvantage in comparison to speakers. This finding undermines the suggestion that STM limitations may cause doubling, as these limitations do not appear to be relevant in sentence production, which according to Boutla et al. (2004) is a better measure of linguistic working memory. Of course, this does not automatically mean that in comprehension tasks signers and speakers will show no difference. Further research on linguistic working memory in signed and spoken languages is necessary.

In addition, it is important to distinguish any cognitive motivation for doubling as discussed in this section and the function of doubling in RSL, NGT or any other sign language. The fact that doubling is a frequent phenomenon (both in a sign language and cross-linguistically in the visual modality) might be connected to the STM limitations. However, doubling is certainly a part of the grammar of the sign languages in question. In this chapter it was shown that doubling in RSL and NGT is a grammatical phenomenon, even though the motivation for developing of this phenomenon might be cognitive (namely, STM limitations).

5.6 Conclusions

In this chapter, doubling in RSL and NGT has been analyzed based on small corpora of naturalistic monologue signing. Doubling turned out to be very prominent phenomenon in both languages, although the amount of doubling used is probably subject to individual variation. The research has shown that doubling can result from hesitation and clarification (the X X and X X' patterns), but at the same time, doubling with the X Y X(·) pattern is a grammatical mechanism regularly used in these languages. RSL and NGT are similar with respect to doubling: in general, the same types of constituents can be doubled, but NGT has a mechanism of topic doubling which RSL lacks; in addition, the overall frequency of doubling is very similar for the two languages, but in RSL verbal doubling is much more common, while in NGT clause doubling is prevalent within the X Y X(·) pattern.

The most important case of doubling follows the X Y X(·) pattern and is used for foregrounding of the doubled constituent and for emphasis (see figure 5.3). This analysis accounts for doubling of different types of constituents, including topic doubling in NGT. In contrast, previous analyses of doubling as applied to other sign languages (Nunes and de Quadros 2008; Fischer and Janis 1990) cannot be directly applied to RSL or NGT. In

particular, the proposal by Nunes and de Quadros (2008) can only account for doubling with the emphatic function – a minority of cases in RSL and NGT. Fisher and Janis (1990)'s proposal only accounts for verbal doubling when the second instance of the doubled verb is aspectually marked, while the first instance is not. Again, this situation is not very frequent in the RSL and NGT data analyzed here. The current proposal accounts for most of the cases of doubling.

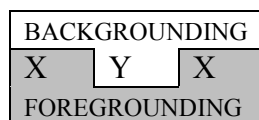


Figure 5.3. Fore- and backgrounding

We also proposed a possible path of grammaticalization from repetition of clauses to clause-internal doubling. This path of grammaticalization describes the emergence of both formal properties and functions of doubling in RSL and NGT (see table 5.6). Although no direct evidence can be given to support this path of development, the synchronic data supports the hypothesis. Direct evidence would only be possible if the early stages of development of RSL and NGT had been documented. Indirectly data from the development of NSL (not yet available) can show whether the prosed diachronic development is also attested elsewhere.

Furthermore, we suggested that emphatic doubling might be a development of foregrounding doubling in RSL and NGT. It is therefore possible to speculate that doubling in ASL and LSB as used for emphatic reasons could have developed via a similar grammaticalization path. The same can be said about the development of emphatic doubling in spoken languages.

Considering the parallels between clause-doubling and clause-internal doubling in RSL and NGT, and the frequency of the former, it would be interesting to look at clause doubling in other sign languages such as ASL and LSB in order to find out whether similar phenomena are attested there. There are some important questions considering doubling in RSL and NGT that have not been discussed in this chapter, namely the syntax of (clause-internal) doubling, as well as prosodic properties of doubling. These questions must be left for future research.

One of the theoretical consequences of the study is that in order to account for the data discussed, the inventory of notions of IS should include the fore- versus backgrounding distinction, which is orthogonal to the topic/focus distinction.

6. Weak hand holds

6.1 Introduction⁷⁵

In this chapter, weak hand holds in Russian Sign Language and Sign Language of the Netherlands are analyzed. As discussed in section 2.5, weak hand holds are a modality-specific strategy which is often used to convey meanings related to IS. However, IS-related holds cannot be analyzed in isolation. As to date, no general analysis of holds has been offered for either RSL or NGT, and we first need to gain a good understanding of the various functions of weak hand holds. The chapter therefore does not focus on IS-related holds only, but describes this phenomenon in general. The discussion will reveal that not all weak hand holds are related to IS. In section 6.5 we return to the question of relation between weak hand holds and IS.

In this chapter, we discuss weak hand hold data from two sign languages that have not previously been studied in this respect, namely RSL and NGT based on corpus data (see also Sáfár and Crasborn 2013). Our aim is to describe each instance of weak hand holds in a set of videos from two sign languages, including both phonetic and functional aspects, in order to

- a) categorize weak hand holds based on form *and* function, especially related to IS (QW1)
- b) describe the frequency of holds in (semi-) spontaneous discourse (QW2)
- c) compare the use of these structures in two sign languages (RSL and NGT) (QW3)
- d) compare the use of holds in two genres (narrative and conversations) (QW4)

We argue that a corpus-based analysis can contribute important new perspectives to this debate. First, instead of being restricted to prototypical examples, corpus data forces researchers to consider each token and can lead to a more comprehensive analysis of holds. In addition, by comparing the frequency of these constructions across languages, we can gather new evidence on whether weak hand holds are primarily restricted by modality-specific or language-specific processes.

Section 6.2 presents the methodology used in this study. Subsequently weak hand holds are analysed with respect to function and form (section 6.3), and the two sign languages are compared to each other concerning the frequency and distribution of holds (section 6.4). Finally, the modality effects and other unresolved issues are discussed (section 6.5).

In addition to the descriptive research of weak hand holds presented in sections 6.1-6.5, section 6.6 is a side track exploring a possible syntactic analysis of some of the weak hand holds (recall question QW5 in section 2.5). Unlike the rest of this dissertation, section 6.6 contains a formal analysis of the syntax of weak hand holds and the rules of linearization. Readers not interested in formal syntactic models might want to skip this section. Note however that some of the holds analysed there are directly related to IS.

⁷⁵ The results presented in this chapter have been reported in Kimmelman (to appear), Kimmelman and Sáfár (2013a) and Sáfár and Kimmelman (2013), based on a joint research project together with Anna Sáfár (Radboud University, Nijmegen).

6.2 Methodology

We first discuss the data analysed (section 6.2.1), then introduce the participants and describe their socio-linguistic characteristics (6.2.2), and finally sketch the annotation procedure (6.2.3).

6.2.1 Data

The data analyzed in this chapter comes from recordings that were initially collected and annotated for different purposes. Some of the RSL and NGT recordings that form the basis for the following discussions have also been used in chapters 3 and 5. In this section, we describe the process of data selection, the resulting data sets, and the annotation procedure, both for Russian Sign Language and Sign Language of the Netherlands.

6.2.1.1 Sign Language of the Netherlands

The NGT data used in this study comprised selected sessions from the Corpus NGT (Crasborn et al. 2008, Crasborn and Zwitserlood 2008a). The sessions included in this study were selected in two phases. A set of cartoon descriptions and personal stories were selected for this whole project on IS (also used in chapter 3, see section 3.2.1). A second set of recordings containing conversational data were selected from the same signers specifically for the study of weak hand holds. As a result, the NGT data set amounts to a total of 1 hour and 32 minutes of recordings from 15 signers, as summarized in table 6.1. While data from narratives is available for all 15 signers, conversational data is available for only 12 signers.

Table 6.1. Summary of the data set. Number of signs is an approximation based on preferred hand glosses.

Language	Genre	Duration	Number of signers	Number of sessions	Number of glosses	Number of signs
NGT	Conversation	31 mins.	12	13	4226	3085
NGT	Narrative	61 mins.	15	41	7736	5248
RSL	Narrative	51 mins.	6	38	8361	5513

The cartoon retelling task and the personal stories task are described in section 3.2.1. In the conversation sessions, signers were asked questions related to deafness (for example, “Do you think deafness is a handicap?”) that served as discussion starters. The questions were presented in the form of pre-recorded clips, in which a deaf signer presented an issue and asked questions related to it. Depending on the ensuing conversation, these sessions are typically around 3 minutes in length, but can be longer (up to 10 minutes).

6.2.1.2 Russian Sign Language

The Russian Sign Language data was collected in 2011. The corpus contains approximately 1 hour of signing by 6 deaf signers. Participants were filmed in pairs as they engaged in semi-spontaneous story telling based on memorable experiences, as well as describing short films to each other. The tasks used in the collection of the corpus were a subset of the tasks used in Corpus NGT, namely the cartoon retelling task and the personal story task have been used. The tasks were organized similarly to the corresponding tasks in Corpus NGT, except

for the fact that signers told several personal stories in a row, not alternating after each story. Thus the RSL and the NGT corpora are comparable in terms of their content and how they were recorded, with the exception that conversational data, similar to the conversations in the Corpus NGT, was not available for RSL.

6.2.2 Participants

For both sign languages, participants are all deaf signers, who use NGT or RSL as their primary language. The participants are the same used for the study described in chapter 3. For the sake of completeness their sociolinguistic properties are summarized in tables 6.2 and 6.3 once more.

Table 6.2. Characteristics of NGT signers participating in the study

Signer	Sex	Age	Age of exposure	Region
1	male	69	0	Amsterdam
2	female	81	2;6	Amsterdam
3	female	63	0	Amsterdam
4	female	77	0	Amsterdam
9	female	30	14	Rotterdam
10	female	35	3	Amsterdam
11	male	39	0	Amsterdam
12	male	39	0	Amsterdam
47	female	59	4	Voorburg
71	male	45	2	Amsterdam
72	female	66	2	Amsterdam
73	female	17	1	Amsterdam
74	female	43	2;6	Amsterdam
83	female	64	2	Amsterdam
84	female	67	5	Amsterdam

For the RSL corpus, data from six signers were collected. The mean age of the signers at the time of recording was 45 years, and the range was from 30 to 58 years. Two of the signers are male, and four are female. All signers are deaf and have deaf relatives. They all come from Moscow and have lived and worked in Moscow for their whole lives. Table 6.3 makes it clear that five of the six signers can be classified as native signers.

Table 6.3. Characteristics of RSL signers participating in the study

Signer	Sex	Age	Age of exposure	City of schooling	Deaf relatives
10	female	30	0	Moscow	mother, father, aunts, uncles, grandparents
12	female	50	0	Moscow	mother, father, sister, husband, son
16	female	29	0	Moscow	mother, husband, sons, daughter, niece
18	male	58	3-4	Moscow	wife, son
19	male	55	0	Moscow	father, mother, sister, uncle, aunt, niece
20	female	41	0	Moscow	father, mother, husband son, daughter

NGT signers constitute a larger and, in some respects, more varied group. As mentioned above, 15 participants were included from the Corpus NGT, four men and eleven women. All signers are from the region of Amsterdam. Signers' age at the time of recording ranged between 17 and 81 years ($M=52.73$). Seven participants reported having at least one deaf parent, resulting in early exposure to NGT. Four signers were exposed to sign language before the age of 3, three signers between 3-6 years of age. One NGT signer reported late exposure to sign language (at 14 years of age).

As we show in section 6.5, sociolinguistic properties can influence some of the weak hand holds properties. However, if we compare only a part of the RSL and NGT data, it is possible to remove these effects from the analysis.

6.2.3 Annotation

6.2.3.1 Pre-existing annotations

The Russian Sign Language data had already been annotated by the author (with the help of RSL signers) prior to the study of weak hand holds reported here, including gloss annotations, sentence level translations, and aspects of IS. NGT narratives had been glossed in part by the Corpus NGT team and in part by the author (again with the help of fluent NGT signers), while clause-level translations were completed by the author in the same manner as with the RSL data. The conversational part of the dataset, consisting of conversation sessions from the Corpus NGT, included gloss annotations from the Corpus NGT.

Gloss annotations were similar for both sign languages. Annotations were created for each sign on two gloss tiers, representing the right and left hand respectively. The content of the annotations reflected the meaning of the sign. In line with the annotation conventions of the Corpus NGT (Crasborn and Zwitserlood 2008b), the activity of the each hand was annotated separately, so that – crucial for this analysis – if a hand was maintained in the same configuration after executing a sign, the length of the gloss annotation reflected this. One-handed signs were annotated on the tier corresponding to the hand articulating the sign, while two-handed signs received an annotation on each of the two hand-tiers (fully or partially overlapping, depending on the level of synchronization between the two hands) (see

figure 6.1). Thus we can see from the example in figure 6.1 that the signs WILL and YES are articulated with the right hand only, whereas SIGN is articulated firstly with both hands and then held on the left hand.

RH-gloss [99]	IX-1	sign	will	yes
LH-gloss [54]		sign		
sentence [52]	I will sign.			

Figure 6.1 Snapshot of an ELAN annotation of an NGT text with each hand glossed separately.

As a result of this two-tiered approach to gloss annotation, the number of glosses does not correspond to the number of signs, since one-handed signs receive one gloss annotation but two-handed signs are represented by two glosses. The number of signs can be approximated by taking the number of glosses on the tier corresponding to the preferred hand of the signer (the hand used more often to articulate one-handed signs); however, this may be problematic in the case of ambidextrous signers, who use the right and left hand with nearly equal frequency (see Sáfár 2012 for further discussion).

6.2.3.2 Annotations created for the present study

The procedure of coding of the weak hand holds involved coding on multiple tiers. First, all holds were identified using a simple definition:

The location and handshape of a sign on the one hand are preserved while the other hand articulates at least one full sign.

On one tier, the formal properties of the holds were described: handedness of the sign participating in the hold (whether it was one-handed, two-handed symmetric, or two-handed asymmetric; Battison 1978) and whether the hold was progressive (spreading forwards) or regressive. On a separate tier, we marked whether the right boundary of the hold coincided with a new sign on the same hand or not, that is, whether the hold ended because the hand that had been held participated in a new sign. Finally, on the last tier, we listed the functions of holds in terms of categories developed for this study. The weak hand holds in the RSL corpus were annotated by myself, and the holds in the NGT corpus by A. Sáfár (Sáfár and Kimmelman (2013)). In order to ensure agreement, the annotations of each annotator were checked by the other annotator. The final dataset included only holds which the annotators agreed on; this was the majority of all potential holds.

The annotation of the full dataset resulted in 622 weak hand holds recognized by both annotators. Listing signs (11 tokens) and PALMS-UP signs (34 tokens) were excluded (for the motivation to exclude these from analysis see section 6.3.6). As described above, the analysis of the functions of these signs is beyond the scope of this study.

This led to 622 cases of weak hand holds in the complete dataset of nearly 2.5 hours of signing from the two sign languages. Table 6.4 shows for each language and genre the number of potential holds and the number of holds included in the analysis.

Table 6.4. Number of weak hand holds across genres in RSL and NGT

Language	Genre	No. of glosses	Holds
RSL	Narrative	8361	350
NGT	Narrative	7736	171
	Conversation	4226	100
Total		20323	622

6.3 Functions of holds

In this section, we describe the functions of holds based on the analysis of the data presented in section 6.2. One of the main aims of this study was to determine the functions of weak hand holds in RSL and NGT. The question of determining functions, and even defining what a function of a hold can be, is far from trivial, so it is necessary to state clearly what we mean when we say that a hold has a particular function.

In our analysis all holds can be categorized into four groups according to functions: phonetic, syntactic, discourse-related, and iconic. In the following subsections these types are further divided into categories and examples are provided. Note that these labels are descriptive, and further analysis might lead to a more fine-grained classification of functions (for instance, in section 6.6 we call some of the holds parenthetical – a term not used in this section). Syntactic holds include holds of subjects, objects and verbs across the whole sentence, as well as holds of a noun phrase head across the whole noun phrase. Holds with iconic function often but not always appear in inter-clausal contexts and include holds expressing simultaneity and locative relations between objects. Discourse-related holds occur in intra-clausal contexts and have such functions as marking a discourse topics or semantic relations between sentences.

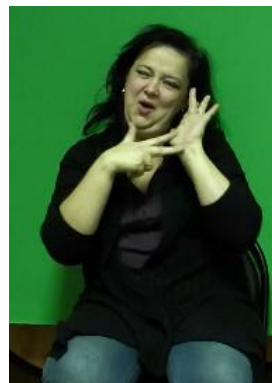
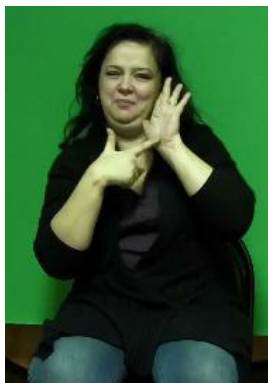
First, we discuss the holds that do not strictly speaking have a function, that is, phonetic holds (section 6.3.1). Then in sections 6.3.2-6.3.4 different types of functions (syntactic, iconic and discourse functions) are discussed. Section 6.3.5 elaborates on the relation between functions and formal characteristics of holds. Finally, section 6.3.6 summarizes the discussion of functions of holds.

6.3.1 Phonetic holds

The first “function” we identified was a hold motivated by phonetics. A phonetic hold is usually a short hold during which the hand is held in some configuration for the ease of articulation. For instance, a hand can be held because it is reused as a part of the following sign: in (1) the base hand of the sign SEVEN is immediately reused in the following sign EIGHT.

(1)

[RSL-s2-20]

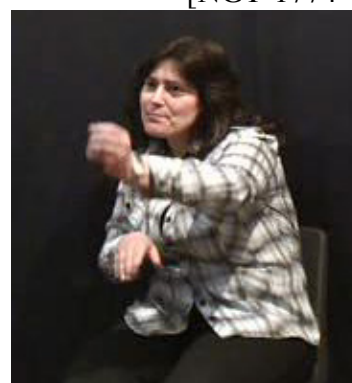
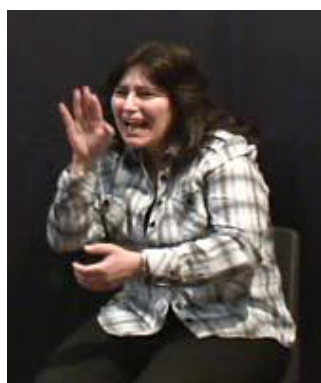


h1: APPROXIMATELY SEVEN⁷⁶-----
 h2: APPROXIMATELY SEVEN EIGHT YEAR
 '[He was] approximately seven or eight years old.'

A hold may appear in a situation in which some sign appears twice in the utterance (with one or more other signs between the occurrences – that is, following the X Y X doubling pattern), and one hand is held from the first occurrence to the second one (2). The hold is phonetic in this case as well since the signer anticipates the second occurrence of the sign so that the configuration and the location of the sign are preserved on the weak hand.⁷⁷ For instance, in (2) the sign PIPE appears twice with the sign WATER in between, so while signing WATER the weak hand of PIPE is held in anticipation of the second occurrence.

(2)

[NGT-1774-74]



h1: PIPE WATER⁷⁸
 h2: PIPE-----
 'water pipe'

Such holds are related to articulation and do not have meaning as such. In other cases there is a meaningful relation between the information expressed by the two hands. In such cases we suggest that the hold is truly motivated by its function.

⁷⁶ The signs SEVEN and EIGHT both use the base hand in the shape of B or 5 which can be analyzed as expressing the meaning 'five'; however, the same base hand is used in numbers 15-17 where it cannot mean 'five', so we decided not to decompose the sign into meaningful parts FIVE and TWO/THREE.

⁷⁷ Pfau and Aboh (2012) call this a "harmonizing process".

⁷⁸ + is used to gloss simultaneous signs so that PIPE+WATER means that these two signs are realized simultaneously.

6.3.2 Marking a syntactic domain

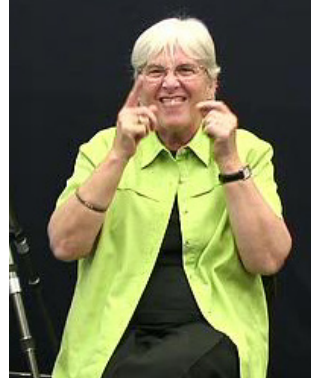
A common type of weak hand hold is when a head or a dependent in a syntactic constituent spreads across this constituent. The various contexts in which such holds occur are discussed below. The function of the hold is to mark the corresponding syntactic domain.

Within noun phrases part of the noun can spread across its dependents (adjectives and pointing signs, which can be determiners or demonstratives), or (rarely) an adjective can spread across the head noun. For instance, in (3a) the noun CAT spreads across the following pointing sign IX, while in (3b) the adjective OTHER spreads across the noun R-E-I-S ‘flight’.

(3) a. [NGT-19-03]



CAT



IX

h1:

h2:

‘the cat’

b.



OTHER



R-E-I-S (‘flight’)

h1:

h2:

‘another flight’

[RSL-s1-10]

At the clause-level, the verb can spread across its arguments and adjuncts, as in the case where the verb FLIGHT spreads across the adjunct IX-UP (4a), but also the subject, the object or an adverb can spread across the verb, as in (4b) where the subject MONKEY spreads across the verb DESIRE. Unlike spreading within noun phrases, spreading of dependents across the head at the clause-level is quite common.

(4) a.

[NGT-92-2]



h1: IX
FRIEND

FLIGHT

IX-UP

h2: FLIGHT-----
FRIEND
'The friend runs away up there.'

b.

[RSL-cr4-18]



h1: MONKEY

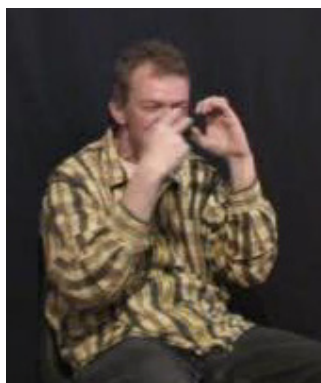
DESIRE

h2: MONKEY-----
'The monkey wants it very much.'

Furthermore, sometimes a verb spreads across one or more verbs following it. In many cases, it is possible to say that we observe a serial-verb construction (Aikhenvald 2006), so the verbs belong to one clause and refer to one complex action (but see also section 5.2 for the discussion of this construction as a subtype of doubling). In (5) the verb LOOK.IN.TELESCOPE spreads across the following semantically related verb LOOK.

(5)

[NGT-1712-71]



h1: CL:LOOK.IN.TELESCOPE LOOK
 h2: CL:LOOK.IN.TELESCOPE-----
 'He looks through the telescope.'

We also found other examples that can be subsumed under syntactic holds, namely the spreading of a *wh*-word across the whole sentence, and spreading of a preposition across its dependent. However, holds in these contexts were not frequent in our sample, and as a result we cannot analyse them further here.

Note that Nespor and Sandler (1999) have argued that similar holds in a different sign language (ISL) fulfil a prosodic rather than a syntactic function. In particular, they suggest that holds mark prosodic domains, namely phonological phrases. For instance, in (6) the verb BAKE and the subject IX-1 constitute one phonological phrase, this being also the domain of the weak hand hold.

(6) h1: IX-1 BAKE [ISL]
 h2: -----BAKE
 'I bake' (adapted from Nespor and Sandler 1999:163).

However, the domain of spreading in (6) can be also described in syntactic terms: the verbal predicate is held across the whole clause. Theories of prosody differ with respect to how much access prosody has to syntax, in other words, whether syntactic units themselves can determine the domain of application of phonological rules (Elordieta 2008). In theories like Seidl (2001), syntactic relationships distinguish phonological constituency. Therefore, describing prosodic processes in syntactic terms is not unknown in linguistic theory.

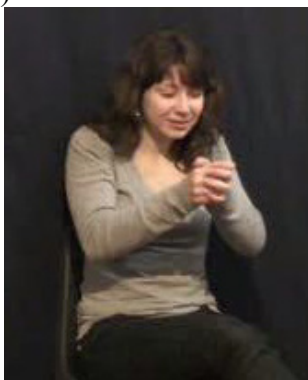
For the sake of the argument, let us assume for the moment that weak hand holds indeed span across prosodic domains (phonological phrases or probably intonational phrases), since it is also plausible to expect that syntactic units would be mapped onto prosodic units. To test this hypothesis a larger corpus and strict definitions of prosodic domains in RSL and NGT are needed. Nevertheless, we have some evidence that this hypothesis is not correct in the strict sense.

Prosodic units are defined in different ways in sign language research (Nespor and Sandler 1999). One common idea is that prosodic domains are marked by non-manuals, as discussed in chapters 3 and 4. For RSL, Prozorova (2009) has argued that head and body movements mark prosodic domains. If we look at the syntactic weak hand holds from our corpora, we can find examples with clear (non-manual) prosodic boundaries within holds. For instance, in (7) there is a hold of the verb HOLD spanning across the subject CAT, which is marked by raised eyebrows, most likely forming a separate Intonational Phrase used for clarification. Examples such as (7) are not rare in our data.

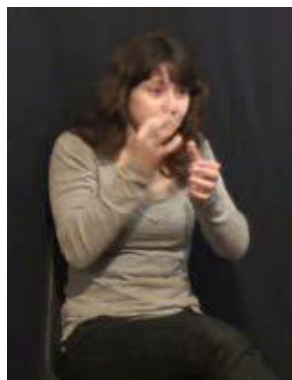
We conclude that the RSL and NGT data on weak hand holds are compatible with the following hypothesis: holds are used to mark syntactic constituents (noun phrases, VPs, sentences). No reference to prosodic domains is necessary to account for the facts. Note that Brentari and Crossley (2002) have also shown that weak hand holds are not reliable predictors of prosodic units in ASL, which might be an argument in favour of syntactic formulations of the rules for ASL as well. However, we do not exclude the possibility that further research will show that at least some of the holds analysed here as syntactic are better accounted for in prosodic terms.

(7)

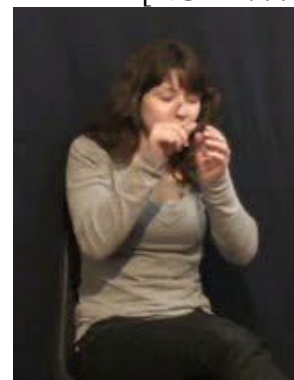
[NGT-1777-73]



CL:HOLD



CAT+CL:HOLD



CANARY

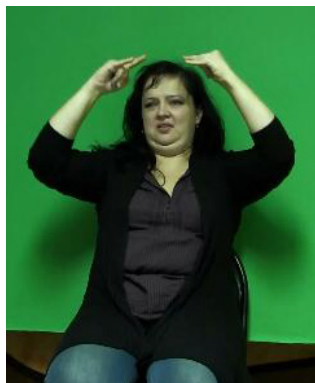
		<u>er</u>		
h1:	HOLD /	CAT /	CANARY	BIRD HOLD
h2:	HOLD-----			BIRD HOLD
	'The cat holds the canary.'			

6.3.3 Iconic functions

Holds with iconic functions appear both in intra-clausal and inter-clausal contexts. Probably the clearest instance of the first type of hold is what we call *background in locative construction*. In this type of hold, the weak hand represents an entity that is localized in space (the background), and is held while the other hand signs the figure and/or the locative relation between the two. For instance, in (8a) the GRANNY is located with respect to the open window, which is expressed through the hold of the verb WINDOW.OPEN; in (8b) the locative situation of the cat climbing into the pipe is described with the help of holding the sign PIPE. In such cases, the function of the weak hand is clear: a topographic relation is created between the two hands that is interpreted as the locative relation between the referents they represent.

(8) a.

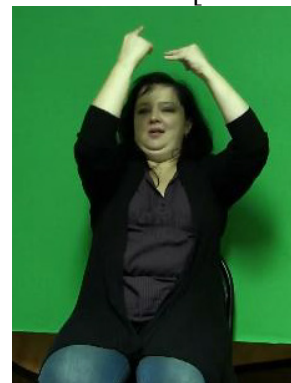
[RSL-cr5-20]



CL:WINDOW.OPEN



GRANNY



IX

h1:

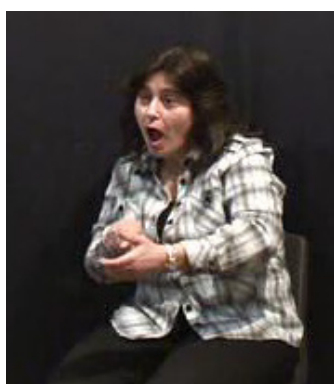
h2:

CL:WINDOW.OPEN-----

‘The window opens. The granny is there.’

b.

[NGT-1774-74]



IX



CL:GET.IN



CL:CLIMB.UP

h1:

h2:

PIPE-----

‘He climbs into the pipe’

Another category we found useful in describing the contexts in which holds appear with an iconic function is that of *simultaneity*. We used this category to describe cases where, typically, a verb (usually under role shift) is held while the other hand signs the following sentence. There is no structural relation between the verb on the weak hand and the following sentence, rather what links the hold and the signs articulated by the other hands is the simultaneity of events described. In (9) the cat offers the banana and simultaneously calls the monkey; the verb OFFER is held across the following verb CALL. Thus the temporal simultaneity of two events is expressed iconically by the (partially) simultaneous use of the two hands. Note that it is the presence of the hold itself that creates the meaning of simultaneity of actions. If the hold was not there, the actions could still have been interpreted as occurring simultaneously, but this meaning would not have been expressed by linguistic means.

(9)

[NGT-1715-72]



h1:

BANANA

h2:

CL:OFFER-----

CALL

‘He offers the banana and calls [the monkey].’

It is worth noting that holds expressing the meaning of simultaneity almost always occur in the context of role shift. The first sentence that introduces the hold usually contains a role shift that also spreads across the second sentence. For instance, in example (9), the signer takes role of the cat while signing CL:OFFER, and the shift continues in the next sentence CALL.

6.3.4 Discourse-related functions

We identified three functions of holds that are discourse-related, namely *verb as sentence topic*, *noun as topic*, and *anchoring a referent*. However, they occur in different contexts: while the first two are clause-external, the last one is mostly clause-internal. In the first type, two clauses following each other are in some logical relation; this can be specified by saying that the first sentence as a whole is the topic of the following sentence. In this case, the verb OVER ‘to finish, to stop’ can spread across (a part of) the following sentence IX FINALLY MAY OUT (10). The function of this hold is to show that the sentences are semantically related to each other, namely that he (the son) was finally allowed to go out *because* his sickness was over.

(10)

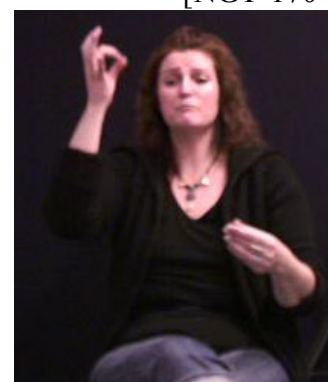
[NGT-170-10]



OVER



FINALLY+OVER



OUT+OVER

h1: NOW IX OVER. IX FINALLY MAY OUT

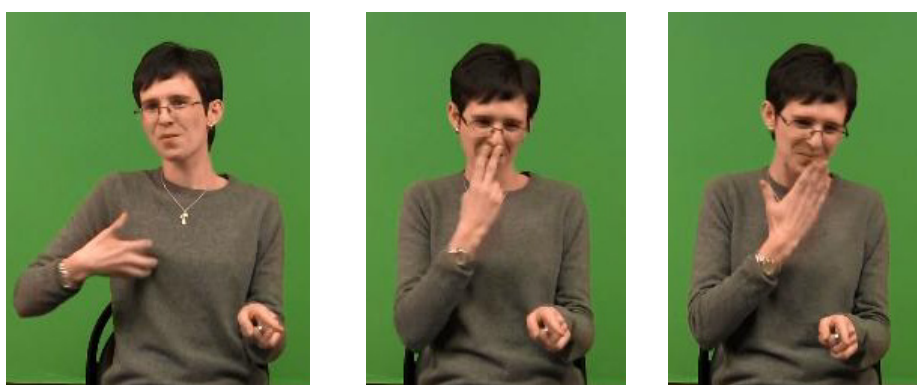
h2: OVER-----

‘Now it was over. So he finally was allowed to go out.’

Brentari and Crossley (2002) discuss similar types of holds in ASL and claim that they represent the phenomenon of Forward-Referencing. In spoken languages there are intonational means to show that two Intonational Phrases are semantically related to each other; Brentari and Crossley argue that the weak hand hold has a similar function.

Another hold type that crosses sentence-boundaries is *noun as topic*, which means that a noun prominent for some stretch of discourse (i.e. a discourse topic) is held across several sentences. Example (11) shows that the pronoun IX can have different syntactic functions in different sentences: it can be subject or object, but in all sentences following the first, it is the topic of the sentence. One should also note that most often the noun is actually realized as a pronoun, which is to be expected because topics are often pronominalized (section 3.4). The function of such holds is to mark a discourse topic: although any part of discourse potentially contains a discourse topic, or theme, it does not have to be marked.

(11) [RSL-cr4-10]



MONKEY+IX

LOOK+IX

NICE+IX

h1: THINK MONKEY. LOOK. NICE.

h2: IX-----

‘She thinks it is a monkey. She looks at it. It is nice!’

The last type of discourse-related holds usually does not cross sentence boundaries. Formally speaking, it can be analysed as a syntactic hold. However, unlike other syntactic holds it appears to have a discourse function. Sometimes when a referent is mentioned for the first time, a pointing sign is used to anchor this referent in discourse and it is often held while the other hand signs the noun and its dependents. In (12) the referent CANARY is actually articulated simultaneously with the pointing sign that anchors it, and this pointing sign is held while the other hand signs another IX and a fingerspelled sequence further identifying the referent.

(12)

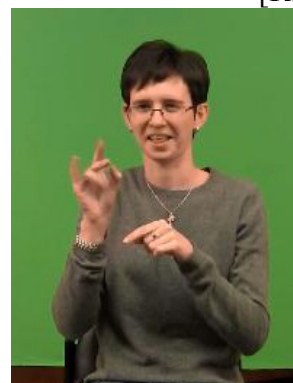
[RSL-cr1-10]



CANARY+IX-a



IX-b+IX-a



K-A-N-A-R-E-Y-K-A+IX-a

h1: APPEAR CANARY IX-b K-A-N-A-R-E-Y-K-A

h2: IX-b-----

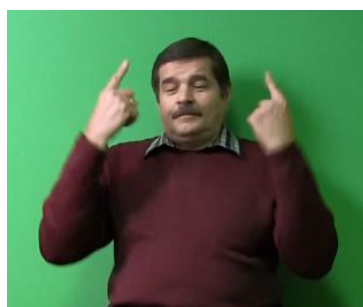
‘There appears a canary.’

The function of this kind of hold is actually not exactly clear: it seems that the function of the pointing sign is to establish a locus for a new referent. However, a pointing sign without a hold could fulfil the same function as well. In addition, note that in (12) the pointing which is held points to a location different from the other pointing sign in the sentence.⁷⁹ The canary which is described in this example is actually located above the signer, so the non-held pointing is the one which establishes the locus. Therefore, the function of the held pointing sign is better described as marking an important referent in discourse. This is in a way similar to the function of doubling of topics in NGT, described in section 3.3.1.2. Johnston (2013) also describes the same type of holds in Auslan, and argues that the held pointing sign is a determiner.

In addition, sometimes holds occur in connection with discourse-regulating mechanisms, namely *interjection* or *repair*. For instance, in (13) the signer reacts to the question of the addressee on the active hand, holding the sign from the main storyline THIRD on the weak hand.

(13)

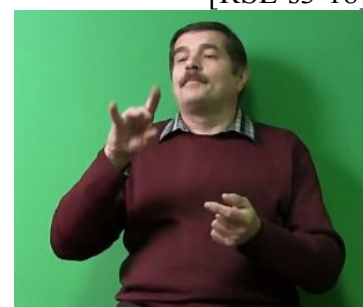
[RSL-s3-18]



PORTRAIT



THIRD.

N-A-T-U-R-M-O-R-T
(‘still.life’)

h1:

PORTRAIT

THIRD-----

h2:

‘Thirdly, [I can draw] portraits. Still lifes [I said before].’

⁷⁹ This is not always the case. In some examples both pointing signs are directed towards the same locus.

We found a few cases where one hand was held during a repair sequence; these we also classified under discourse-related functions.

6.3.5 Form-function relations

After having presented the functions of holds in RSL and NGT, we have to discuss the issue of form-function relations. It has been argued previously (Liddell 2003) that many of the weak hand holds are actually fixed form-function units called buoys. For instance, pointer buoys and list buoys were proposed by Liddell (2003), and a new category called point buoys was proposed by Vogt-Svendsen and Bergman (2007).

The pointer buoy, according to Liddell, is a pointing sign held on the weak hand to refer to the discourse topic. The point buoy is also a pointing sign but is used to refer not to a referent but to a point in space or time with respect to which some other elements are located. However, we have seen that pointing signs can be held with many different functions, namely they can be subjects or objects spreading across the verb, they can represent a discourse topic, and they can be used to anchor a new referent. Furthermore, the point buoy is actually an instantiation of the more general function of background in locative construction. Thus, the holds involving pointing signs can have different functions, but these functions are not unique to pointing – nouns can be held in the same functions as well. The only exception is pointing to anchor a referent – this function appears indeed to be unique to pointing holds. Therefore we have to conclude that the term “pointer buoys” and “point buoys” are notions created by conflation of form and function of holds.

The creation of a category through conflation of form and function is even more obvious in the case of the so-called “fragment buoys” which is a cover term for all the different types of non-pointing holds that we have discussed. It is obvious that different “fragments” have different functions and therefore they should not be analysed as one category.

The same can probably be said about list buoys, because the lists held on the weak hand can have different functions: listing, subject or object, conjunction or disjunction, and probably some others. However, since our data includes only a few listing holds, we will not discuss them further.⁸⁰

Our proposal seems to be closer to Miller’s (2000) who classified holds according to their functions, although, there are some differences. For instance, he suggests the following two categories: holds of nouns used to encode topical elements and holds of pronouns and determiners to encode syntactic relationship (between a subject and a predicate or a determiner and a noun). Again we think that the conflation of form and function is misguided as it blurs important distinctions. In our data, topical elements can be nominal and pronominal, and subjects and objects can also be nominal and pronominal.

Finally, we need to mention that sometimes a hold can have more than one function or combine functions and other motivations. For instance, sometimes a hold that occurs in a doubling context (which we classified as a phonetic hold above) can have some additional function, such as the head of a noun phrase, or background in locative construction (recall example (2) where the hold can be caused by doubling but also has a function of the noun phrase head spreading across its dependent). Furthermore, a noun as topic can be characterized as a hold of a subject or an object inside each of the relevant sentences.

⁸⁰ Another representative of a possibly overgeneralized category (to our knowledge, not proposed in the literature) is holding the PALMS-UP sign (PU). This kind of hold is quite common in our data. However, it is clear that as PU is a multifunctional sign (McKee and Wallingford 2011), so holds involving this sign can have many different functions as well. Analysing these functions falls out of the scope of this chapter.

6.3.6 Summary: form and function of weak hand holds

In table 6.5 below, we summarize the functions of weak hand holds as found in RSL and NGT, and the forms of the holds, according to the classification suggested by Liddell (2003). Once again it is obvious that the buoy labels proposed by Liddell cannot capture the variety of functions that the holds have.

There are some other functions that we do not describe here because of the scarcity of data in our corpora. Firstly, RSL and NGT have holds which can be called list buoys, but the corpora analysed contain only a few examples. We hypothesize that list buoys will also have different functions, including syntactic (representing a subject, an object or an NP head), discourse (representing thematic referents), and also a function not mentioned in the table, namely expressing conjunction and disjunction (Davidson 2012). Further research is needed to test this hypothesis. Secondly, the hold of the PU gesture, as mentioned above, can have many functions as well that are not discussed in this chapter.

Table 6.5. Forms and functions of holds in RSL and NGT

Domain	Function	Form
Syntactic	object	pointing, fragment, (list)
	subject	pointing, fragment, (list)
	verb/predicate	fragment
	serial-verb construction	fragment
	noun phrase head	pointing, fragment, (list)
	adverb	fragment
	wh-word	fragment
	preposition	fragment
Discourse	anchoring a referent	pointing
	noun as topic	pointing, fragment, (list)
	verb as sentence topic	fragment
	interjection, repair	any
Iconic	simultaneity	fragment
	background in locative construction	pointing, fragment

In sum, RSL and NGT have very similar holds with the same functions. However, it is informative to also look at frequency and formal characteristics of holds in these languages, because differences might be quantitative, not qualitative. In the next section, we look at these characteristics of weak hand holds and compare RSL to NGT and narratives to conversations.

6.4 Frequency and distribution of hold types

In analysing the quantitative aspects of weak hand holds in RSL and NGT, we will compute the overall frequency of holds in the two languages, and the distribution of holds across the four major types (section 6.4.1). We will compare the two languages to each other (section 6.4.1.1) and conduct a cross-genre comparison for holds in NGT (section 6.4.1.2). In addition, we will analyse formal characteristic of holds, such as length and handedness, and compare

different types of holds to each other (section 6.4.2). Some differences can be found both between languages and between genres if frequency and distribution of holds are taken into account and discuss the consequences in section 6.4.3, and also in section 6.5.

6.4.1 Overall frequency of weak hand holds

As mentioned at the end of section 6.2.3, we have collected 622 cases of weak hand holds in the complete dataset of nearly 2.5 hours of signing from the two sign languages. Table 6.4 (repeated as 6.6) shows for each language and genre the number of potential holds and the number of holds included in the analysis.

Table 6.6. Number of weak hand holds across genres

Language	Genre	No. of glosses	Holds
RSL	Narrative	8361	350
NGT	Narrative	7736	171
	Conversation	4226	100
Total		20323	622

In order to be able to analyse the distribution of different types of holds, we used the three major groups: syntactic, discourse and iconic holds, as described in table 6.5. We also added a fourth category of phonetic holds which subsumes holds re-using the base hand, holds for doubling, and unclear cases. During the annotation phase, we assigned multiple functions to each token where appropriate. While the majority of holds (75%, 468 holds) was assigned to a single type, 23% (143 holds) of the tokens belonged to two types and 2% (11 holds) belonged to three or four types. Table 6.7 summarizes the proportion of holds belonging to one and two type categories in order to show the frequency of combinations. The total percentage of holds assigned each type, regardless of overlaps, is also indicated.

Table 6.7. Proportion of holds belonging to a single type category or two categories and the total percentage of holds assigned each type. The percentages in the first four columns add up to 98%, as the 2% of holds belonging to three or four types are not represented. The figures in the last column show the percentage of holds assigned a type, regardless of the overlaps between the categories – as a result these percentages do not add up to 100% (622 holds).

Type	Percentage belonging to a single type	Percentage belonging to two types			Total percentage of holds assigned to each type
		Iconic	Syntactic	Phonetic	
Iconic	31%				46%
Syntactic	27%	4%			40%
Phonetic	9%	6%	6%		25%
Discourse	9%	3%	1%	2%	16%

Iconic functions were most frequently assigned overall, 46% of holds were annotated as having an iconic function, and 31% (193 tokens) had only an iconic function. Syntactic functions were the second most frequent, with 40% of holds assigned a syntactic function and 27% (167 tokens) having only syntactic functions. Phonetic motivation was detected in 25% of holds overall, but only in 9% without other types of functions (54 tokens). Discourse

functions were least frequent, being found in 16% of holds overall and in isolation only in 9% (54 tokens). In general, each function can co-occur with some other function which complicates the analysis.

In the analyses regarding functional categories in the following sections, we will focus on holds that belonged to the single type only (N=468). While this means eliminating 25% of the tokens from some of the analyses, this approach will allow us to focus on the characteristics and distribution of each type.

In order to be able to quantitatively compare the use of weak hand holds across languages and genres, we calculated a holds rate separately for each participant and genre. The holds rate is the average number of weak hand holds per 100 glosses, calculated by dividing the number of holds by the number of glosses (for each participant and genre separately) and multiplying the resulting figure by 100. By using this measure we control for differing sample sizes across participants and genres.

6.4.1.1 Cross-linguistic differences

First, we were interested in whether there are any differences between RSL and NGT in the rate of weak hand holds or the types of holds used. We hypothesized that we would *not* find differences between the two languages, because we assumed that the use of the modality-specific articulatory resource of the two hands would be governed mainly by general motoric and cognitive constraints rather than language-specific principles. Furthermore, previous research on different sign languages (both descriptions of individual languages and cross-linguistic comparisons) seems to suggest the existence of similar types of simultaneous constructions.

Since we did not have access to conversational data from RSL, we restricted the comparison of the two languages to the narrative subsets of our data. We first consider the weak hand hold rate in RSL and NGT narratives (see table 6.8).

Table 6.8. Rate of weak hand holds (average number of holds per 100 glosses)

Language	Genre	N	Mean	SD	Min	Max
RSL	Narrative	6	4.69	1.66	3.24	6.94
NGT	Narrative	15	2.37	1.59	0.22	5.38

As mentioned above, we expected to find similar rates of weak hand holds in the two languages. Contrary to this hypothesis, we found that RSL signers produced twice as many holds (M=4.69, SD=1.66) than NGT signers (M=2.37, SD=1.59), as shown in figure 6.2. This difference between the two languages was significant ($t(19)=2.98$, $p=0.008$).

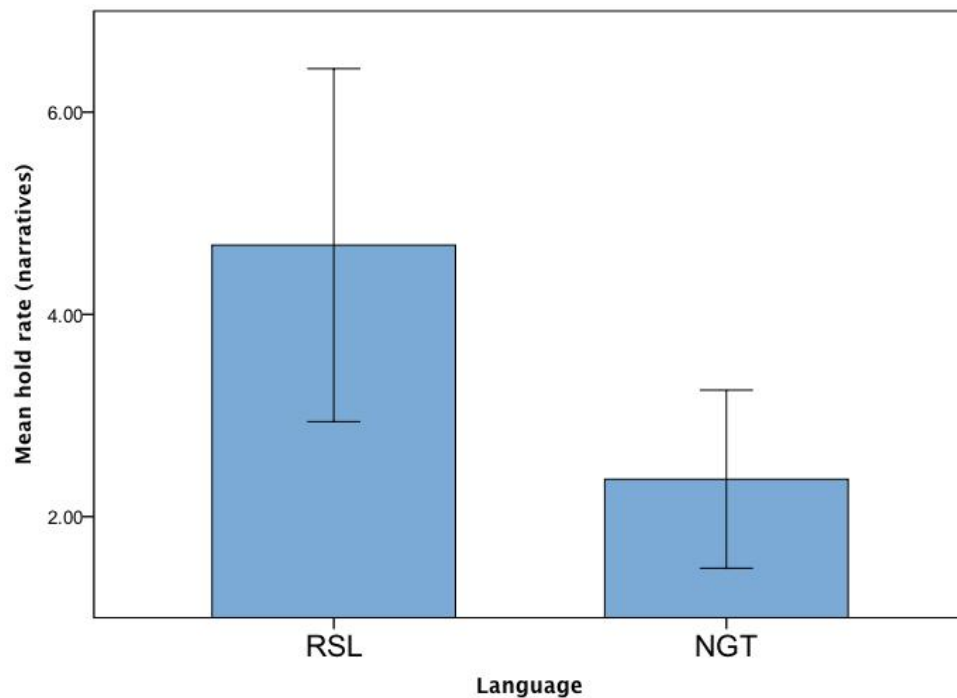


Figure 6.2. Mean weak hand holds rate for RSL and NGT narratives. Error bars represent 95% confidence interval.

As this finding was unexpected, we looked for variables that could explain this difference between the two languages. As described above (section 6.2.2), the sample of RSL signers was smaller (6 participants) than that of NGT signers (15 participants). The group of NGT signers was furthermore more varied in terms of age and language background. We first considered the effect of age, by selecting NGT signers matched in age to RSL signers. The difference between the two groups remained significant ($t(10)=3.26$, $p=0.009$), age-matched NGT still signers produced a lower rate of holds than RSL signers ($N=6$, $M=1.95$, $SD=1.21$).

The NGT group showed more variation in terms of language background as well, with more participants having hearing parents and as a result not being exposed to NGT from birth. In order to test whether this difference between the samples might explain the results, we compared holds rates between RSL and NGT signers who reported having at least one deaf parent. We still found a significant difference ($t(10)=2.33$, $p=0.042$) between NGT signers ($N=7$, $M=2.26$, $SD=1.48$) and RSL signers ($N=5$, $M=4.31$, $SD=1.55$).

Finally, we also tested the difference between the two groups of signers in the Canary Row narratives only. As we described above, the narrative data used in this study included retellings of cartoons as well as personal narratives. While personal narratives varied in content, the retellings of cartoon clips can be expected to be highly similar in terms of content. Looking at holds rates in cartoon retellings only, we again found a significant difference ($t(14)=3.86$, $p=0.002$) between RSL signers ($N=6$, $M=6.51$, $SD=1.80$) and NGT signers ($N=10$,⁸¹ $M=2.97$, $SD=1.76$).

To sum up, we have found a robust difference in overall frequency of holds between RSL and NGT, even when controlled for sociolinguistic factors and the content of the stories. This means that this is a cross-linguistic difference that needs explanation; see section 6.5.1.

⁸¹ Canary Row narratives were available from ten NGT signers only.

Looking at the distribution of the types of holds in the two languages,⁸² we found no significant difference in the frequency of hold types between RSL and NGT narratives (N=387, $\chi^2=6.78$, $df=3$, $p=0.079$), even though the proportion of phonetic and syntactic holds was higher in RSL and the proportion of iconic holds higher in NGT (table 6.9, figure 6.3).

Table 6.9. Distribution of holds in narratives

	Genre	N	Phonetic	Iconic	Discourse	Syntactic
NGT	Narrative	123	7%	59%	9%	26%
RSL	Narrative	264	12%	45%	11%	33%

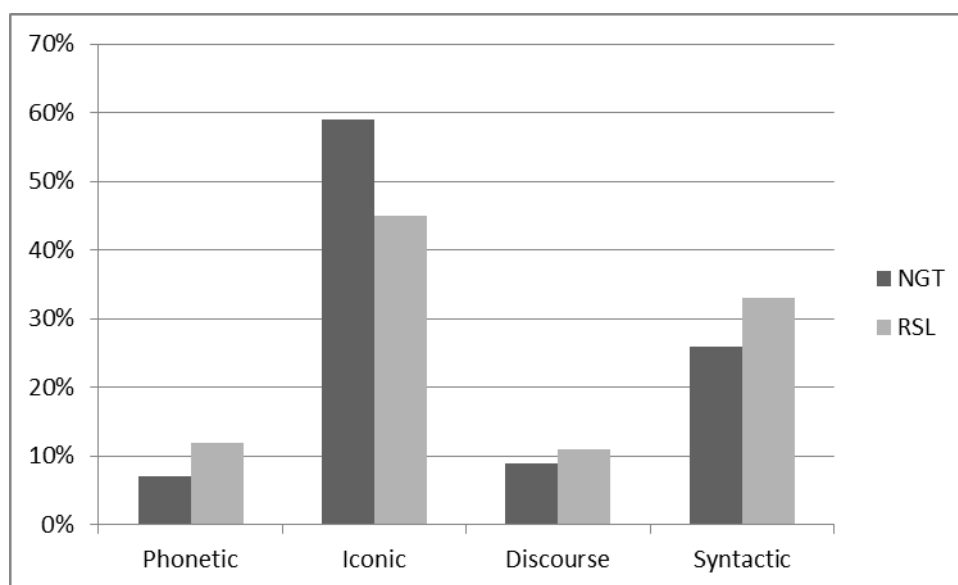


Figure 6.3. Distribution of weak hand hold in RSL and NGT narratives. The observed differences are not statistically significant.

6.4.1.2 Genre differences

As described in section 6.2, for NGT, our dataset included two types of language production: narratives and conversation. The conversational data involved signers discussing issues related to deafness and sign language, after being prompted by a short description of an issue and related questions. We expected to find a higher rate of holds in narrative signing, due to the higher number of iconic structures and two-handed constructions in this type of signing (Sáfár 2013, Sáfár et al. in press).

Although the whole NGT dataset involved 15 participants, conversational data was only available for 12 signers. In the comparison of the two genres only these signers were included, that is the participants for whom both narrative and conversational data were available. Descriptives for this subset of the data are presented in table 6.10.

⁸² Only taking into account holds that belonged to one type only.

Table 6.10. Descriptive statistics of weak hand holds in narratives and conversation in NGT

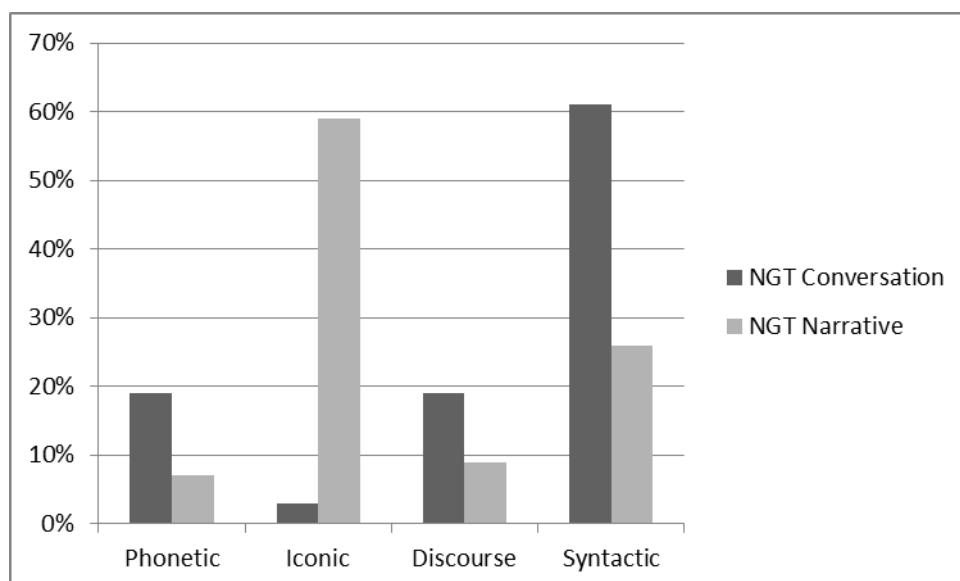
Language	Genre	N	Mean	SD	Min	Max
NGT	Narrative	12	2.51	1.59	0.94	5.38
	Conversation	12	2.04	1.62	0.37	6.56

Contrary to our expectations, the rate of weak hand hold use was only slightly higher in narratives ($M=2.51$, $SD=1.59$) than in conversations ($M=2.04$, $SD=1.62$) and this difference was not significant ($t(11)=0.61$, $p=0.56$).

However, we did find significant differences between the two genres in terms of the distribution of the types of holds ($N=204$, $\chi^2=66.71$, $df=3$, $p<0.001$). There was a higher percentage of syntactic holds in conversations (61%) than in narratives (26%), and iconic holds were used more often in narratives (59%) than in conversations (3%). The differences in the two categories are responsible for the effect, but there were also differences in the distribution of phonetic and discourse holds, both of which occurred more often in conversations than in narratives (table 6.11, figure 6.4).

Table 6.11. Distribution of weak hand holds in narratives and discussions in NGT

Language	Genre	N	Phonetic	Iconic	Discourse	Syntactic
NGT	Conversation	81	19%	3%	19%	61%
NGT	Narrative	123	7%	59%	9%	26%

**Figure 6.4.** Distribution of weak hand holds in NGT narratives and conversations

6.4.2 Phonetic characteristics

6.4.2.1 Length

As a corpus-based investigation, our study can describe some of the phonetic aspects of weak hand holds in a quantitative manner. The first question we consider in this respect is how long

holds are maintained. First we will consider length in terms of the number of signs articulated by the other hand while the weak hand is held before looking at the number of sentences spanned by holds.

Number of overlapping gloss annotations

We calculated the number of overlapping glosses with each hold. The mean length of holds was similar for RSL (3.47) and NGT (3.86). Overall, 80% of holds overlapped with four or fewer signs on the other hand (table 6.12). Another 18% spanned 5-10 signs, with a little less than 2% being held for the duration of more than ten signs (up to 29).

Table 6.12. Number of overlapping glosses in weak hand holds in RSL and NGT

Language	N	Mean	SD	Min	Max
NGT	271	3.61	2.80	1	29
RSL	350	3.47	1.79	1	13

While there was no significant difference between the two languages in the mean length of holds ($t(435)=-0.75$, $p=0.452$), an ANOVA showed significant differences between different types of holds ($N=468$,⁸³ $F(3)=15.70$, $p<0.001$). The longest holds fulfilled discourse-related functions (mean length 4.61 overlapping glosses), and iconic holds were similar in length (mean length 3.91 signs, not a significant difference). Phonetic and syntactic holds were significantly shorter than the other types (overlapping with 3.00 and 2.68 signs on average, not a significant difference) (table 6.13).

Table 6.13. Length of different types of weak hand holds

Type	N	Mean	SD	Min	Max
discourse	54	4.63	4.15	1	29
iconic	193	3.91	2.37	1	20
phonetic	54	3.00	0.91	1	6
syntactic	167	2.68	1.05	1	7
Total	468	3.45	2.29		

Sentences

In narratives, sentence-level annotations were available. On average, holds spanned two sentences, and again there was no difference between the languages ($t(519)=-0.44$, $p=0.658$) (table 6.14).

Table 6.14. Number of weak hand holds across sentences in RSL and NGT narratives

Language	N	Min	Max	Mean	SD
NGT Narratives	171	1	10	2.11	1.27
RSL Narratives	350	1	8	2.06	1.12

⁸³ Taking into account only those holds which belong to a single type.

A little more than one third (36%) of all narrative holds was intra-clausal, that is, were simultaneous with one sentence-level annotation only. Slightly more, 38% of holds, crossed one sentence boundary, being simultaneous with two sentence annotations. Sixteen percent of holds were maintained across two sentence boundaries and ten percent overlapped with four or more sentences (see figure 6.5).

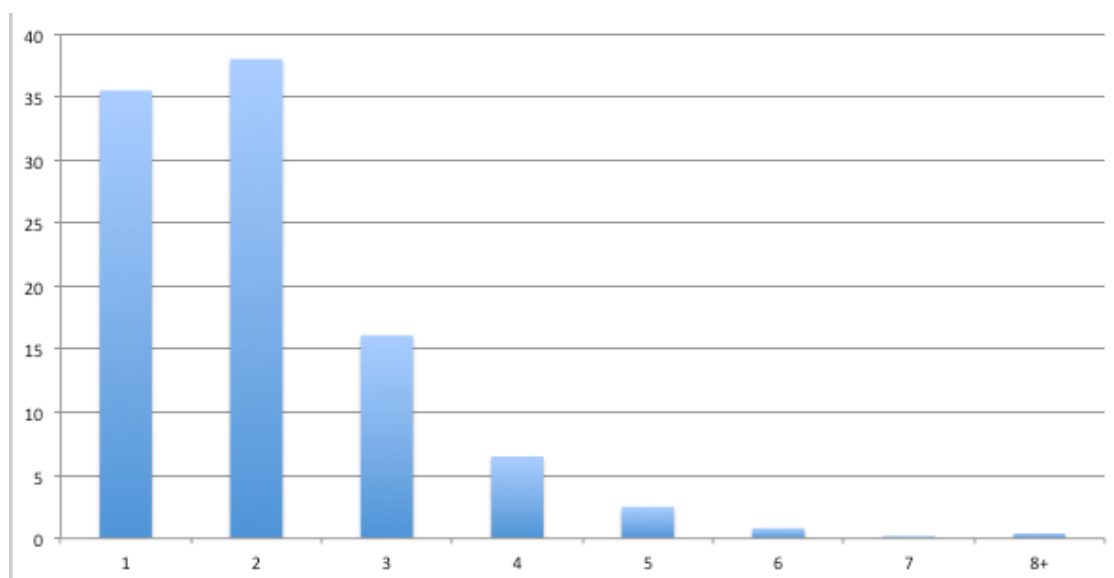


Figure 6.5. Number of sentences simultaneous with a hold in both languages combined

Similar to the number of overlapping gloss annotations, we again found that different types of holds differed in the average number of overlapping sentences ($N=387$, $F(3)=28.29$, $p<0.001$). The pattern was similar to that described above, in that discourse and iconic holds were longest (with no significant difference between these two types), followed by phonetic and finally syntactic holds (table 6.15).

Table 6.15. Length of different types of weak hand holds in overlapping sentences

Type	N	Mean	SD	Min	Max
discourse	39	2.38	0.75	1	4
iconic	191	2.43	1.25	1	8
phonetic	39	1.92	0.81	1	4
syntactic	118	1.38	0.60	1	4

6.4.2.2 Handedness of the source sign

The handedness (one- or two-handed) of the sign which was held (the source sign) is interesting. Most holds originated in two-handed signs, with 52% of the source signs being symmetric and 22% asymmetric. Nonetheless, 26% of holds had a one-handed sign as its source. Compared to the overall frequency of different sign types (see figure 6.6), we see a reversed pattern. In NGT discourse, nearly 70% of the signs are one-handed (Sáfár 2013). Two-handed signs constitute only 30% of the signs articulated in casual discourse, yet they give rise to 75% of all holds.

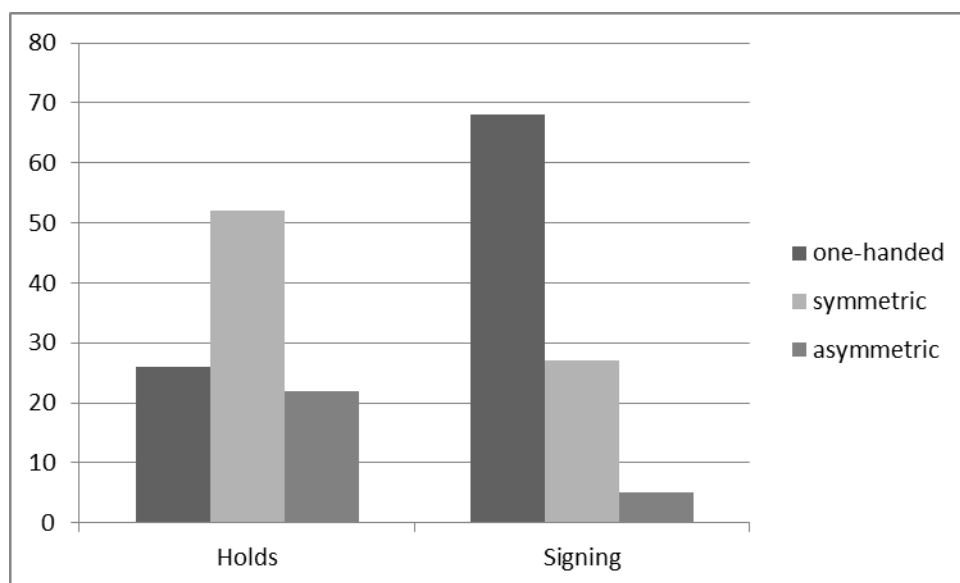


Figure 6.6. Handedness in weak hand holds and in non-overlapping signs

There is no difference between RSL and NGT in terms of source sign handedness ($N=621$, $\chi^2=4.76$, $df=2$, $p=0.093$), see table 6.16 and figure 6.7. However, different types of holds show different patterns ($N=468$, $\chi^2=27.91$, $df=5$, $p < 0.001$). In particular, discourse and iconic holds are more likely to originate in one-handed signs (44% and 37%, respectively) than phonetic and syntactic holds (13% and 22%). Over 80% of phonetic holds stem from two-handed signs.

This finding indirectly supports the categories that we proposed. In particular, it appears that one-handed signs are usually held for discourse or iconic purposes, while two-handed signs are likely to be held for phonetic and probably prosodic reasons. On the other hand, contrary to the general claims of some researchers based on the data from other sign languages (Nespor and Sandler 1999), we have seen that all types of holds can originate in both one-handed and two-handed signs.

Table 6.16. Handedness of different types of weak hand holds

Type	One-handed	Symmetric two-handed	Asymmetric two-handed	Count
Phonetic	13%	56%	32%	54
Iconic	37%	45%	18%	193
Discourse	44%	32%	24%	54
Syntactic	22%	58%	20%	167

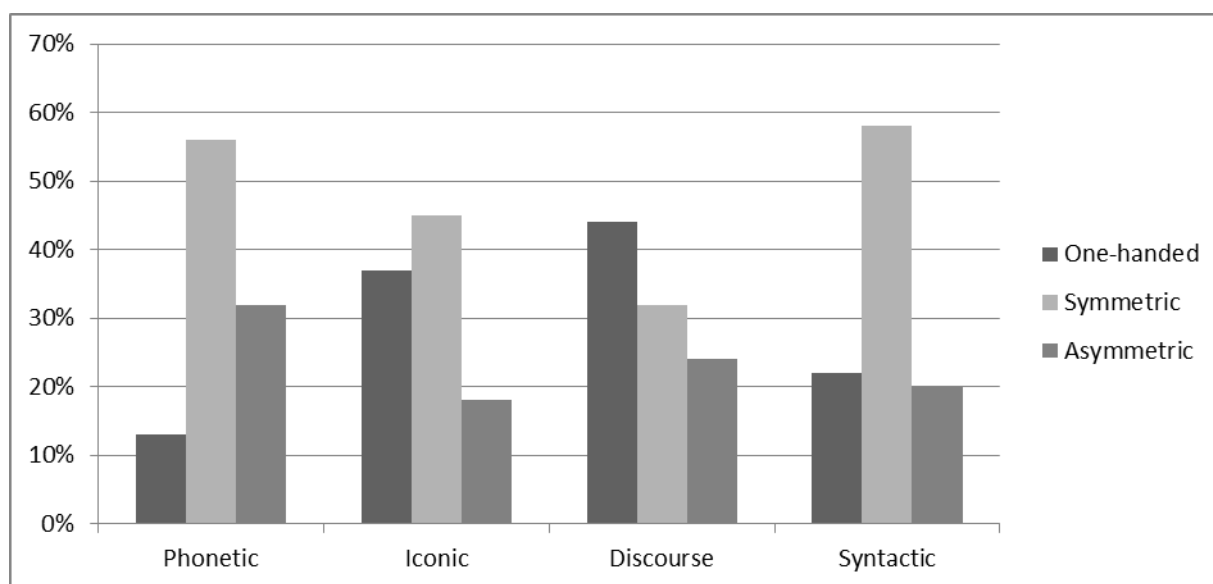


Figure 6.7. Handedness of different types of weak hand holds

6.4.2.3 *Progressive-regressive spreading*

Overall, spreading from the source sign was progressive in the vast majority of holds (97%). There was a significant difference between the two languages in the proportion of regressive vs. progressive spreading ($N=605$, $\chi^2=6.87$, $df=1$, $p=0.009$), with a higher percentage of regressive spreading in RSL (4%) than in NGT (1%). Since only two NGT holds were regressive, we restricted the comparison between types to RSL. There was a significant difference between types in the frequency of regressive spreading ($N=254$, $\chi^2=11.45$, $df=3$, $p=0.01$). This effect was driven by the relatively high proportion of regressive spreading among phonetic holds (10%) compared to other types. There were no cases of regressive spreading among iconic and discourse holds, but 6% of syntactic holds were found to be regressive in RSL. This could be interpreted as meaning that regressive holds are all phonetic in nature, resulting from an anticipation of the following sign on the weak hand. It implies also that the syntactic regressive holds have been misanalysed and should be considered phonetic as well.

6.4.2.4 *Right boundary*

The annotations include information about whether the right boundary of a hold coincides with the articulation of a new sign or not. In cases where the hand that was being held previously participates in a new sign, the articulatory requirements of the new sign overrule the motivation for the hold. Therefore we expected that the right boundary of phonetic holds would more often coincide with a new sign than in the case of other types of holds. Furthermore, the fact that some holds end without the involvement of the held hand in an immediately following sign would suggest that the motivation for weak hand holds is not purely phonetic.

We have found that overall 19% of the holds were not followed by a new sign on the same hand, while 81% were. There was no significant difference between the two languages in this respect: in RSL 18% and in NGT 21% of holds ended without an adjacent sign ($N=621$, $\chi^2=0.90$, $df=1$, $p=0.342$). Contrary to our expectations, we found no significant difference between types of holds: holds with a right boundary coinciding with a new sign

constituted 17% of discourse, 19% of iconic, 20% of syntactic and 22% of phonetic holds ($N=468$, $\chi^2=0.61$, $df=3$, $p=0.894$).

6.4.3 Summary

From the data presented in the previous sections, three important observations can be made: 1) RSL and NGT differ in their overall frequency of holds; 2) Narratives and conversations differ in the distribution of holds, in other words, the type of holds vary with the genre; 3) Different types of holds differ in phonetic characteristics.

The first two observations will be further discussed in section 6.5. The third observation, namely the different phonetic properties of different types of holds, is a further justification of the classification of holds applied in this study. As described in section 6.2, the classification has been done based on functions of holds. It is therefore a non-trivial fact that these types of holds are also different with respect to their phonetic characteristics.

6.5 Discussion

On the basis of this first large-scale corpus-based investigation of weak hand holds together with cross-linguistic and cross-genre comparison in the frequency of weak hand holds, we will first discuss the relation of weak hand holds to IS (section 6.5.1). Then the cross-linguistic and cross-genre differences will be examined together with possible explanations (section 6.5.2). In addition, we emphasize once more the importance of looking both at the form and the function of holds (section 6.5.3). Finally, we discuss the tentative answer to the theoretical question formulated at the beginning of the chapter, namely the role of modality in shaping the properties of weak hand holds (section 6.5.4).

6.5.1 Weak hand holds and Information Structure

As discussed in sections 2.5 and 6.3, some of the functions of weak hand holds are connected to IS. The holds that have been classified as discourse holds are clearly used to express IS-notions. For instance, holds for *verb as sentence topic* create a topic-comment relationship between clauses within one sentence. Holds for *discourse topic* express and emphasize the presence of a discourse topic, in other words, a topical referent that is relevant for several sentences. Finally, holds for *anchoring a referent* are used to establish an important referent in discourse. Taken together, weak hand holds can be used to highlight important information in different configurations.

It is also clear, however, that not all holds are related to IS. In particular, phonetic holds do not have any meaning, so they are not IS-related. Syntactic holds cannot be described in terms of IS either. We have looked at the sentences where a verb is held across the subject or the object, and hypothesized that these holds might have to do with the topical or focal status of subjects and objects. It turns out that both new and old subjects or objects occur in these sentences. The same can be said about sentences where a subject or an object is held across the whole sentence: again, the information status of the held constituent varies. Holds expressing simultaneous actions do not seem to be related to IS, although the event described by the hold could be said to be backgrounded in comparison to the event described by the active hand. However, further analysis is necessary to understand this phenomenon. Finally, holds for background in locative construction have been connected to IS by some researchers. It has been claimed that in the locative situation the background is also always the

scene-setting topic (Meir and Sandler 2008). It is difficult to assess this claim without further research.

From Liddell (2003) it is possible to conclude that all buoys have a discourse function, so they are related to IS. As described above, we do not think that all holds are related to IS; moreover, we consider the notion of buoys itself an overgeneralization. We agree that some of the buoys described by Liddell, for instance, the cases which we call *discourse topics*, are clearly related to IS, while for other potential buoys, such as pointer buoys, or especially fragment buoys, it is more controversial.

There seem to be an iconic relation between the form of the phenomena that we observe here (holds) and their function. The weak hand is less active and the information on the weak hand is backgrounded. The information expressed by the weak hand, too, is backgrounded, as might be the case with simultaneous constructions. However, this generalization does not always hold. In the case of holds for discourse topic, for instance, the discourse topic becomes more active due to the presence of the hold; the same can be said about the holds for anchoring a referent. The general function of the holds would then be not backgrounding the information, but rather emphasizing it. This function is however not applicable to all holds discussed in this chapter.

6.5.2 Differences between genres and languages

In section 6.4, we found significant differences between genres with respect to the distribution of holds. In narratives, iconic holds were used more often than in discussions, while syntactic holds showed the opposite pattern. This fact is probably explained by the content of the analysed texts. Iconic holds, namely holds for background in a locative construction and simultaneity are used in stories when the signer describes spatial and temporal aspects of events, while discussions mostly focus on abstract topics which would not involve such descriptions.

In addition, we have demonstrated that there is a statistically significant difference in the overall frequency of holds in RSL and NGT narratives. Signers of RSL seem to use weak hand holds nearly twice as often as NGT signers. While there were fewer RSL signers than NGT signers, and the latter group was more heterogeneous, the difference between the two languages was present in subsamples of the data matched on age and language background (whether signers had deaf family members). Furthermore, the difference between the two languages was significant even when comparing only Canary Row narratives; this was done in order to ensure that the data was as closely matched in terms of content and context as possible. These findings lead us to conclude that there is indeed a cross-linguistic difference in the frequency of weak hand holds between RSL and NGT.

However, we did not find significant differences in the types of holds between RSL and NGT. In both languages the functions of holds are the same, and the distribution of holds across these functions is very similar if the Canary Row stories are compared.

There are several possible explanations for the difference in frequency of holds between RSL and NGT, but they are all hypothetical at this stage of research.

Firstly, it might be the case that NGT in general is more susceptible to the influence of Dutch than RSL – to the influence of Russian. If this is the case, we would expect to have less very sign-languages specific constructions, such as weak hand holds, and probably also doubling, in NGT than in RSL. However, there is no research investigating the scale of the Dutch influence on NGT in comparison to the Russian influence of RSL.

Secondly, NGT is characterized by a considerable amount of regional lexical variation: there are five major dialects attributed to the five schools for deaf children (Schermer 2004).

Lexical variation in RSL is less well understood, but it seems that the amount of variation is lower. Burkova and Varinova (2012) show that variation is quite low, restricted to only some lexical domains and occurring mainly among young adult signers, despite the large number of schools for deaf children in Russia. There is no reliable data on regional variation of grammar, but if lexical variation is correlated with grammatical variation, we also expect to find differences in this aspect. The alleged higher variation in NGT might lead to a lower degree of grammaticalization of different constructions, including weak hand holds. Again, much more research is needed to support or disprove this hypothesis.

Finally, as Vermeerbergen and Demey (2007) argued, co-speech gesture of hearing people also contain constructions which can be characterized as holds (see also section 6.5.4 and especially chapter 7). These gestural holds might be a source of the holds in sign languages. It might be the case that gestural holds are less common in the Dutch co-speech gestures than they are in Russian co-speech gestures, which might explain the difference between sign languages as well. However, gestural holds have not been studied for Russian or Dutch speakers either so far.

6.5.3 Form and function

In the current study we focused on both formal and functional aspects of weak hand holds in RSL and NGT. Having established the types of holds based on their functions (sections 6.3.2-6.3.4), we also discussed the relation between the functions and the form (section 6.3.5). In particular, it is clear that different forms, such as lexical or pointing signs, can fulfil different functions. Therefore, one of the most important findings is that the rigid connection between functions and forms, which is present to a large extent in Liddell's description of buoys, is not tenable.

Upon further analysis of the phonetic properties it is possible to say that they confirm the functional classification of holds created (section 6.3.6), because holds of different types show different properties. In particular, the length of holds in overlapping glosses and in sentences that the hold spreads across is different for different types of holds, discourse and iconic holds being the longer, and phonetic and syntactic the shorter. This result is not unexpected, because discourse holds are relevant for inter-sentential relations, and iconic holds are not constrained syntactically either. Syntactic holds are naturally short because by definition they appear within one sentence, and phonetic holds are expected to be quite short if they are indeed phonetically motivated, because maintaining a long hold cannot plausibly be attributed to ease of articulation.

Interestingly, the handedness of the signs that are held differs across categories as well. Discourse and iconic holds are more likely to originate in one-handed signs than phonetic or syntactic holds. This may be due to a higher level of semantic motivation in these holds, which may lead to higher levels of acceptable articulatory effort. It has been argued that holds originating in one-handed signs (and thus requiring dominance reversal, where the previously passive hand becomes active) require more articulatory effort than holds originating in two-handed signs (Sáfár and Crasborn 2013). Note, however, that in all categories both one-handed and two-handed signs can be held, so it is not possible to rigidly associate the type of hold with handedness (e.g., Nespor and Sandler 1999).

Finally, in RSL, the difference between types of holds also appears in the percentage of regressive holds: they are only present in phonetic and some syntactic holds, while iconic and discourse holds are all progressive. We suggest that regressive holds might all be phonetic in nature, resulting from an anticipation of the following sign on the weak hand. In the analysis of functions of holds it is better to focus on progressive holds only.

To sum up, based on the analysis of RSL and NGT data, we can better understand the relation between form and function of weak hand holds. It is clear that the categories that we have established do not have a rigid realization in the form of pointing signs or any other category of signs. On the other hand, the categories are different from each other with respect to phonetic properties, which is an additional confirmation of the presence of such categories.

6.5.4 Modality effects

In section 6.1 we posed the question to what extent modality is responsible for the presence and properties of weak hand holds. We have observed several important facts: (1) weak hand holds are present in both RSL and NGT, (2) the overall frequency of weak hand holds is different in RSL and NGT, (3) weak hand holds have the same functions in RSL and NGT, and (4) the distribution of holds across different types is the same in RSL and NGT.

The most straightforward approach is to attribute all similarities between RSL and NGT to the modality, while all differences should be independently motivated. Therefore, the presence of weak hand holds, as well as the functions that weak hand holds fulfil, might be said to result from the visual modality, while the frequency of holds is defined by some other factors.

The fact that weak hand holds exist in sign languages is of course a modality effect. Since two partially independent articulators are available, they can form a construction called weak hand hold. Moreover, ease of articulation probably motivates the presence of at least some weak hand holds in most sign languages. However, although available and articulatory motivated, this construction does not have to exist, as in the case of Adamorobe Sign Language (Nyst 2007).

Furthermore, the presence of the two articulators and the visual-spatial nature of sign languages seem to predict many of the functions that weak hand holds have. For instance, holds expressing a background in locative constructions naturally result from the spatial representations that sign languages use to talk about space. Phonetic holds, as mentioned above, result from ease of articulation considerations. Syntactic and discourse holds are less easily explained by the modality, so one might expect to find more differences in this domain between different sign languages. Although these differences are not observed here, they might be found when more sign languages are taken into account.

Note also that the fact that the distribution of holds across categories is very similar in RSL and NGT is a consequence of the fact that the same categories are present. Since the same types of meaning are expressed in the data that were compared (Canary Row stories) and the same functional types of holds are available in both languages, the distribution is expected to be similar as well.

In addition, the frequency of weak hand holds obviously depends on some factors external to the modality. We hypothesized that these factors may be the degree of standardization and the influence of the spoken language.

When we speak of modality effects, we do not mean the differences between sign languages and spoken languages per se, but only between the modalities. Speakers use the visual modality as well, namely to produce gestures, and according to Vermeerbergen and Demey (2007) constructions parallel to weak hand holds are observed in co-speech gesture, too, as the visual modality allows for it. We do expect, however, to find differences between weak hand holds in sign languages and co-speech gesture in the degree of grammaticalization and probably also in the categories of functions that the holds have. We will also return to this issue in chapter 7.

6.6 A sidestep: a syntactic account of weak hand holds⁸⁴

As discussed in sections 6.1 to 6.5, RSL and NGT demonstrate a great deal of simultaneity. However, the attested simultaneity is neither arbitrary nor unconstrained. In this section, we offer an account of some of the weak hand holds in RSL and NGT within a formal syntactic framework.

The main theoretical problem that some of the holds present for syntactic analysis is the problem of linearization. Spoken languages are mostly linear on the surface, while the syntactic structure is hierarchically organized (Chomsky 1995). Therefore, within a formal analysis, it is necessary to also formulate the linearization rules which turn a syntactic tree into a string of words. However, as the previous discussion has shown, sign languages have two partially independent articulators, which also means that they have more options for linearization. Hence, it is crucial to formulate the rules of linearization for sign languages as well, and to compare them to those of spoken languages, in order to pin down the modality effects. It is suggested that the formalism of multidimensional trees, independently proposed for spoken languages (de Vries 2009), can be applied to these constructions, but that additional modality-specific rules of linearization are also required.

Although, throughout this thesis we choose to remain agnostic with respect to theoretical frameworks given the predominantly descriptive nature of this study, this section is written within a certain theoretical framework, namely Generative Grammar (Chomsky 1995), as a formal analysis of weak hand holds seems appropriate. While other IS-related phenomena (topic, focus and doubling in sign languages) have received some formal analysis (see references in the corresponding chapters), weak hand holds have hardly ever been analysed this way (see Woll 2007 and Miller 2000 for some attempts). Therefore, the aim of this section is to provide an impetus for the formal research of this phenomenon, which might prove fruitful both to sign language research and to theoretical linguistic research in general.

In section 6.6.1, we outline the linearization problem in more detail. Section 6.6.2 introduces the formalism of multidimensional trees and their linearization. In section 6.6.3, we apply this formalism to weak hand holds in RSL and NGT and modify the linearization rules in order to capture the involvement of the weak hand. Finally, in section 6.6.4, we discuss theoretical implications as well as further research directions related to the formal analysis of holds.

6.6.1 The linearization problem

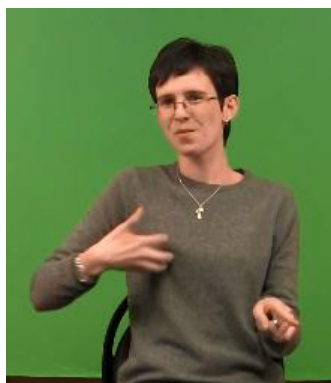
Consider examples (14) and (15) from RSL, also mentioned in section 6.3. These examples demonstrate a hold of a discourse topic (14) and an iconic hold for simultaneity (15).

In examples like (14) and (15), the hold spreads across several clauses; this means that under a prosodic account, we would be dealing at least with a spread at the level of a whole utterance. Moreover, in both examples the presence of the hold adds meaning to the discourse. In (15) the simultaneity of actions (carrying the cage and throwing away the suitcase) is expressed by means of holding the sign CL:CARRY₂. In (14) the emphasis on the discourse topic is only marked by holding of the pointing sign IX.

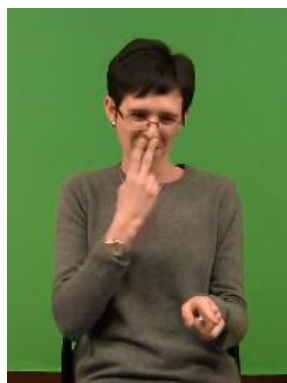
⁸⁴ This section is largely based on Kimmelman (to appear).

(14)

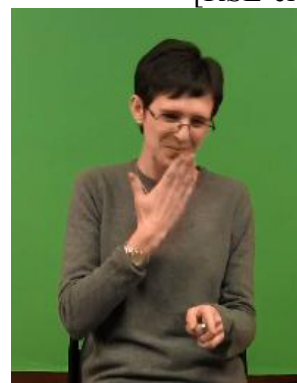
[RSL-cr4-10]



MONKEY+IX



LOOK+IX



NICE+IX

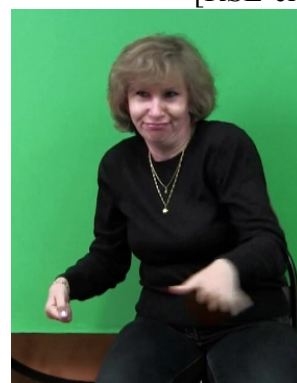
h1: THINK MONKEY. LOOK. NICE.

h2: IX-----

‘She thinks it is a monkey. She looks at it. It is nice!’

(15)

[RSL-cr5-12]

CL:CARRY₁+CL:CARRY₂CL:CARRY₂+NEED.NOTCL:CARRY₂+THROWh1: CL:CARRY₁. SUITCASE NEED.NOT. THROW.h2: CL:CARRY₂-----

‘He carries [the suitcase and the cage]. He does not need the suitcase. He throws it away.’

It is therefore not possible to analyse the weak hand holds in (14) and (15) as purely prosodic, and consequently, they should be represented in syntax. Hence, it is necessary to propose two tiers on which the lexical items are to be linearized: one for each hand. However, if we do that, we also need to formulate the rules of linearization and to describe the restrictions that apply to the use of the second hand.

One hypothesis concerning linearization on two tiers in sign languages is briefly discussed in Woll (2007). It has been suggested that syntactic trees do not contain the ordering information (Chomsky 1995), so the order of elements is only assigned during the linearization process. Woll suggests that, in sign languages, this order need not be assigned because two articulators (two tiers) are available. However, this theory does not pose any restrictions on the potential manual simultaneity, while in fact it is actually quite restricted.

For instance, this theory predicts that, if signs X and Y are sisters in the syntactic tree [X Y], they can be linearized simultaneously: X on the right hand and Y on the left hand (16a). However, fully simultaneous realization of two independent signs (almost) never happens. What we are much more likely to encounter is a structure like (16b):

- (16) a. RH: X
 LH: Y
 b. RH: X----
 LH: Y

Finally, and most importantly, a theory which allows syntactic trees to freely linearize on two separate tiers does not explain the semantic effects observed in (14) and (15). In order to describe the generation of examples (14) and (15), the following questions should be answered: 1. What is the syntactic position of the sign on the weak hand? 2. What are the rules of linearization for sign languages? A possible solution to this problem involves the formalism of multidimensional trees presented in the next section.

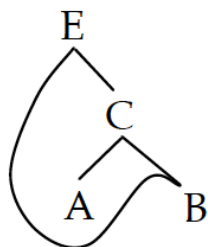
6.6.2 Multidominance in spoken languages

Different researchers (De Vries 2008, 2009, Van Riemsdijk 2006, among many others) argued that multidominant structures are necessary to account for a class of phenomena in spoken languages. Notice that different terms have been used to describe these structures, including *grafts* (Van Riemsdijk), and *External Rmerge* (De Vries). Below the works of De Vries are discussed, as he explicitly formulated linearization rules for such structures.

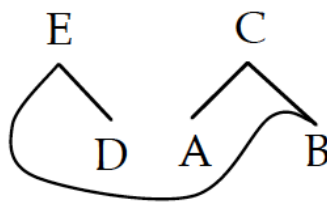
De Vries (2009) claimed that within the standard assumptions of Generative Grammar, multidominance (that is, the situation when one node is dominated by at least two other nodes) is a necessary type of construction. He argued that there are three basic types of Merge: (i) simple Merge, when two independent elements are joined (17a); (ii) Internal Rmerge, when an element is joined with a part of itself – also known as movement (17b); and (iii) External Rmerge, when an element is joined with a part of another element (17c). Given that movement is already a multidominant construction, the third logical possibility (External Rmerge) is not surprising; both Internal and External Rmerge are visualized in (18).

- (17) a. Merge: $\text{Merge}(A, B) \rightarrow [{}_C AB]$
 b. Internal Rmerge: $\text{Merge}(B, [{}_C AB]) \rightarrow [{}_E B [{}_C AB]]$
 c. External Rmerge: $\text{Merge}(B, D)$, where $[{}_C BA] \rightarrow [{}_E D [{}_C B]_D A]_C$

(18)



Internal Rmerge



External Rmerge

Apart from theoretical reasons to have External Rmerge, there are a number of constructions that are best analysed with this formalism. These constructions include Right Node Raising (19a), across-the-board movement (19a), free relatives, appositives, and others.

- (19) a. John admires ____, but Jill hates Bush.

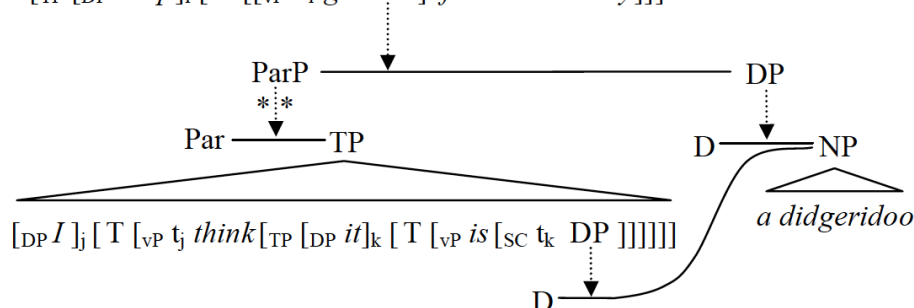
- b. Which man does John admire ____ but Bill hate ____?

These constructions cannot be analysed through movement because they do not show the properties traditionally associated with movement, such as island effects. For instance, compare (20a) to (20b): the latter is ungrammatical because the wh-phrase *what* cannot move across the boundary of a complex noun phrase *men who sell ____*, while the former is grammatical, because, under the External Rmerge analysis, no movement is involved. Further arguments in favour of External Rmerge can be found in the works of Van Riemsdijk and De Vries.

- (20) a. Mary likes [men who sell ____], but she hates [men who buy *cars*].
b. *What does Mary like [men who sell ____]?

De Vries (2009, 2012) proposed yet another kind of merge, namely *Parenthetical Merge*, which is independent of the three types of merge mentioned above. In these examples, merging elements always creates the c-command relationship between them. However, parenthetical merge is oblique with respect to the c-command relationship: the elements of the parenthetical are not c-commanded by the elements of the main sentence and do not c-command them. Parenthetical Merge can combine with multidominance but is independent of it; the combination of both mechanisms is called “amalgams”. For instance, (21a) contains a parenthetical clause *I think it's a didgeridoo*, merged by Parenthetical Merge, while the DP *a didgeridoo* is also shared as it belongs both to the main clause and to the parenthetical clause (De Vries 2011). (21b) gives the structure of this sentence.

- (21) a. Joop got *I think it's a didgeridoo* for his birthday.
b. [TP [DP Joop]_i [T [[_{VP} t_i got DP] for his birthday]]]



In examples like (21) and (22), where Parenthetical Merge and External Rmerge are combined, interesting effects arise. For instance, (22a) is ungrammatical because of the Principle C violation. *Ed* in (22a) belongs to both the main and the parenthetical clause, and in the main clause it is c-commanded by the coreferent pronoun *he*: “*He_i had seen Ed_i*”, which is a direct violation of Principle C (Chomsky 1981). However, (22b) is grammatical because *Ed* only belongs to the parenthetical clause. The main clause now is “*He had seen Anna*” with no coreference. Although *he* and *Ed* are still coreferent, the pronoun no longer c-commands the noun, because the parenthetical clause is not transparent for the c-command relation.

- (22) a. **He_i had seen I think it was Ed_i on tv yesterday.*
b. *He_i had seen – Ed_i said it was Anna on tv yesterday.*

Since External Rmerge and Internal Rmerge create multidominance, it is necessary to explicitly formulate the rules of linearization of such structures. Note that linearization rules for Internal Rmerge and External Rmerge should be different, because, in the former case,

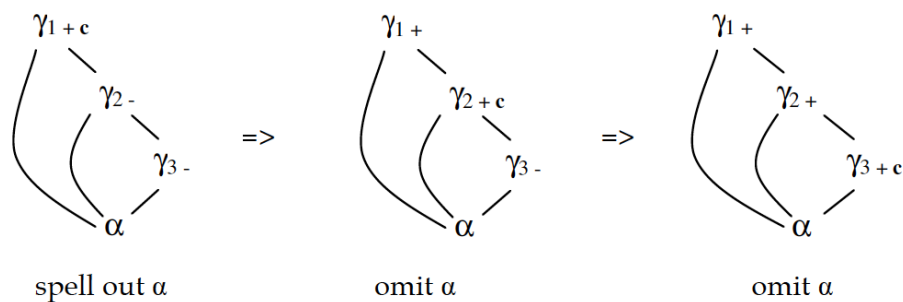
the node is spelled-out in the left-most position (20b), while in the latter case it is spelled-out in the right-most position (20a).

De Vries (2009) describes the linearization as a graph traversal procedure. An assumption in this procedure is that the relation of precedence is defined for sisters in the tree (Langendoen 2003, contrary to Chomsky (1995)). The traversal mechanism is formulated in the terms of selecting nodes and performing linearization (spell-out). For the present discussion, the relevant part of the rule is formulated in (23).

- (23) *Spell-Out of Remerged Nodes* (De Vries 2009:381)
 A node with more than one parent is linearized if and only if
- (i) the current parent is not dominated by any other parent, and
 - (ii) – every parent has been traversed, or
 – the current parent dominates every other parent that has not been traversed

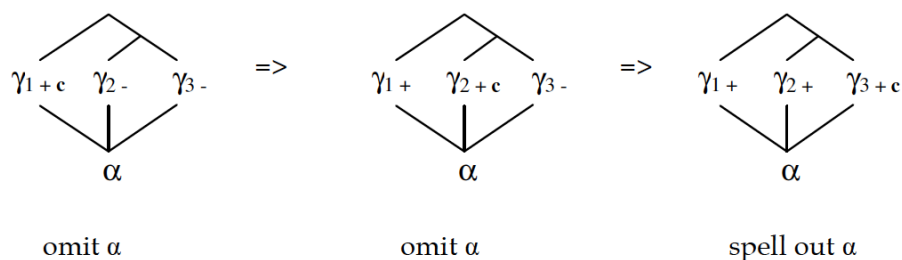
Consider the linearization of a movement configuration (24). In this configuration, terminal node α is dominated by three parents: γ_1 , γ_2 and γ_3 . γ_1 is not dominated by any other parent of α , so (23i) is satisfied. According to the second part of the (23ii) condition, α will be spelled-out in the left-most configuration (as a daughter of γ_1 , because γ_1 dominates both γ_2 and γ_3). To put it simply, with Internal Rmerge the highest copy is spelled out.

- (24) Linearization of Internal Rmerge (De Vries 2009:380)



In (25) the linearization of an External Rmerge configuration is visualized. γ_1 is not dominated by any other parent of α , so (23i) is satisfied. Since γ_1 , γ_2 and γ_3 do not dominate each other, according to condition (23ii), α will be spelled-out in the right-most configuration, when all other parents except for γ_3 will have been traversed. This agrees with the observed fact that in External Rmerge the rightmost copy is spelled out, as in (19).

- (25) Linearization of External Rmerge (De Vries 2009:379)



Having introduced the mechanism of generation and linearization of multidominant structures, it is now possible to turn to the analysis of weak hand holds in RSL and NGT.

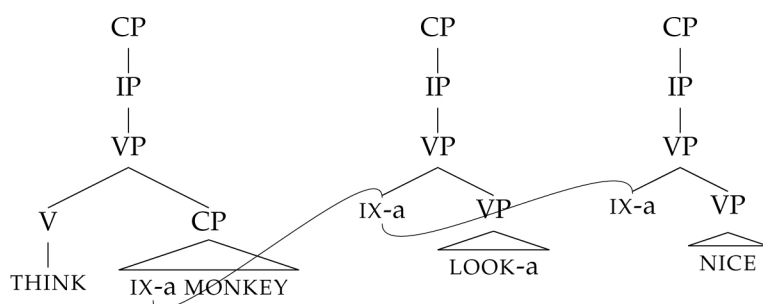
6.6.3 Multidominance and weak hand holds

The hypothesis pursued in this chapter is very simple: in RSL and NGT (and presumably other sign languages) the nodes created through External Remerge are linearized on the second tier, which is activated precisely for this purpose. In section 6.6.3.1 we describe the syntactic structure of two types of holds presented above. In section 6.6.3.2 the linearization rules are formulated. Section 6.6.3.3 contains a discussion on the problem of multirooted structures which are generated by our analysis. Finally, section 6.6.3.4 discusses a separate linearization procedure for parentheticals.

6.6.3.1 Syntax of weak hand holds

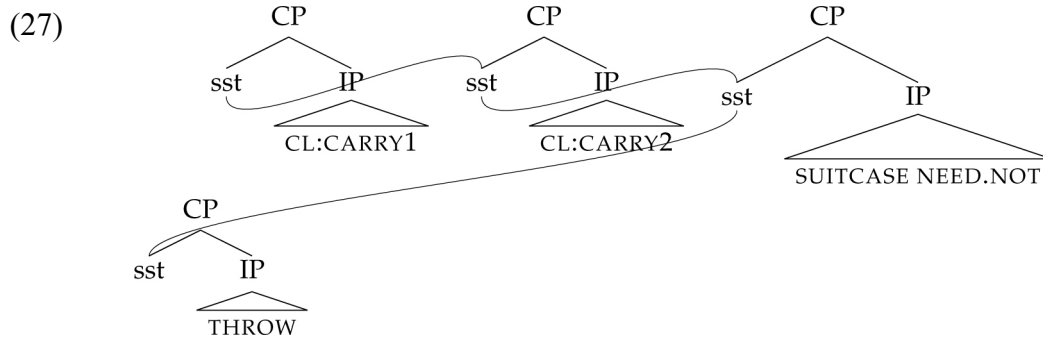
First, let us consider the syntactic structure of examples (14) and (15), and then the linearization rules. Example (14) consists of three sentences sharing the node IX. This constituent has different syntactic roles within each of the sentences: it is the subject of an embedded clause in the first one (thinks *it* is a monkey), an object in the second one (looks at *it*) and the subject in the third one (*it* is nice), but it belongs to all of them (26). Since the node is shared, a multidominant structure is created.

(26)



‘She thinks it is a monkey. She looks at it. It is nice.’

Example (15) is less straightforward, since it is not the case that the sign CL:CARRY₂, which is held, belongs to the four sentences. It is possible to suggest that the shared node in this case is a zero scene-setting topic (for more information on scene-setting topics in RSL and NGT, see chapter 3). The scene-setting topic sets the temporal and spatial framework for the situation described in the sentence. In this case the fact that the node is shared produces the relevant semantic effect, namely that the activities described in the sentences on the two tiers occur simultaneously (27). In particular, the cat carries the suitcase, realizes that it is not necessary and throws it away, all the time simultaneously carrying the cage. All four situations happen within a short period of time that is represented by the null topic. Since the shared node is a null element, special rules of linearization have to be formulated.



‘He carries [the suitcase and the cage]. He does not need the suitcase. He throws it away.’

6.6.3.2 Linearization of holds

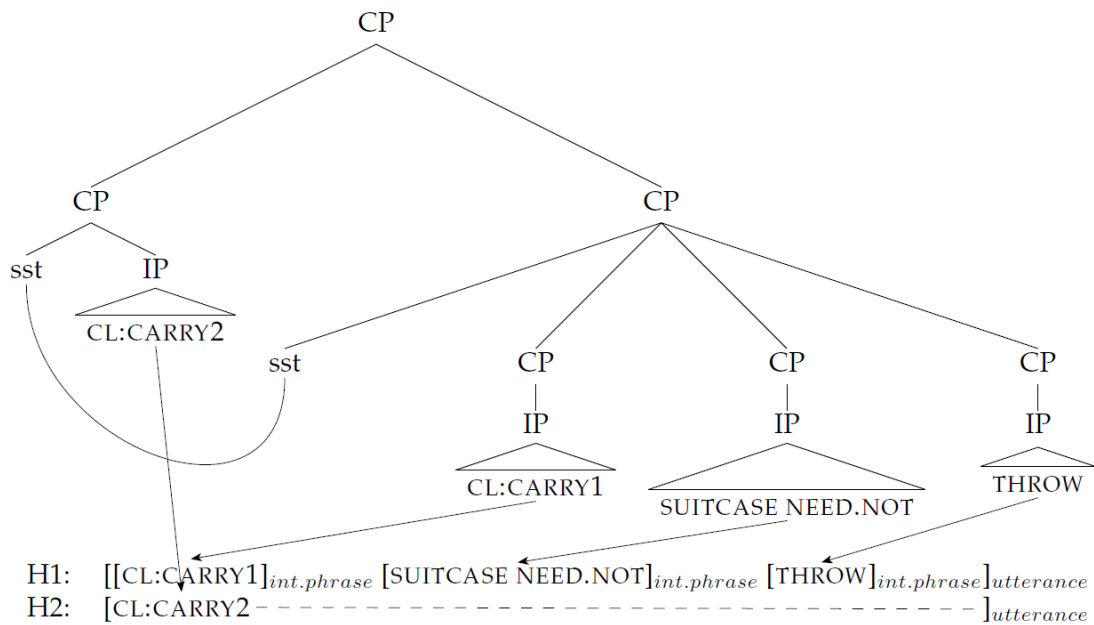
The main rule of linearization for External Remerge in sign languages can be formulated as in (28). Note that condition (ii) is designed to account for examples like (27), where the shared node is phonologically empty. Despite being stipulated, it is not illogical: if activation of the second tier is caused by the presence of a shared node, then some mechanism should be involved to compensate for the fact that the shared node can be phonologically empty.

(28) *Spell-Out of Externally Remerged Nodes in RSL and NGT*

- (i) A node with more than one parent (and the parents of which do not dominate each other) is linearized on the second tier.
- (ii) If the node is phonologically empty, the next node in the line gets linearized on the second tier.

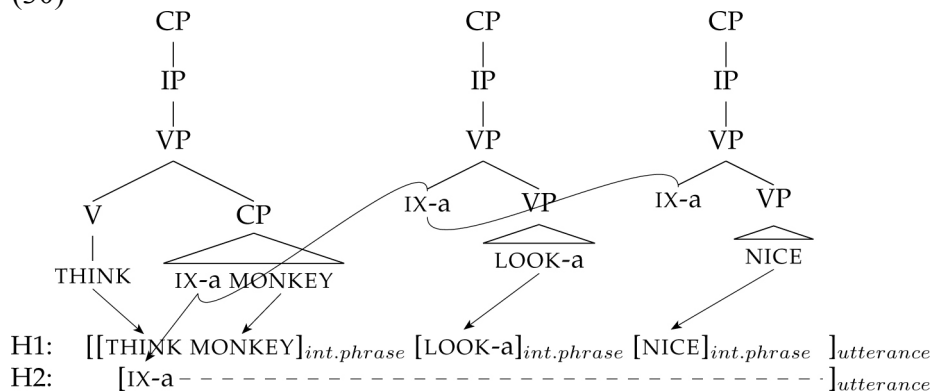
The linearization of (14) and (15) can be visualized as (29) and (30). In (29) the shared node IX is linearized on the second tier. In (30) the shared node is the zero scene-setting topic, so the verb CL:CARRY₂ is linearized on the second tier.

(29)



‘She thinks it is a monkey. She looks at it. It is nice.’

(30)



‘He carries [the suitcase and the cage]. He does not need the suitcase. He throws it away.’

Note that the question of synchronization of utterances between the tiers is an independent issue. The linearization rules in (28) specify the conditions in which the second tier is activated and the node that is linearized on the second tier. As for the synchronization of the tiers, independent prosodic rules should account for that. Based on the examples from RSL and NGT, the following rules can be suggested:

(31) *Prosodic alignment of tiers in RSL and NGT*

- (i) If two tiers are active, each one is mapped onto a single utterance.
- (ii) If two utterances appear on two tiers, their edges should be aligned.
- (iii) If one sign has to constitute an utterance, it is realized as a hold, not as repetition of the full sign.

The first condition in (31) is stipulated. We suppose that the second tier also contains an utterance, if so does the first tier, but one can also formulate a rule creating a phonological phrase on the second tier if necessary.

The fact that the edges of the utterances on the two tiers coincide is probably caused by the fact that only one structure is projected onto both tiers. However, if we look at (14) we can see that the left edges of the utterances appear not to be aligned: the sign IX does not start simultaneously with the first sign THINK on the first tier, but after the THINK is completed. This is probably caused by the same grammaticalized cognitive constraint that prohibits independent movement of two hands within lexical signs (Battison 1978) (32).

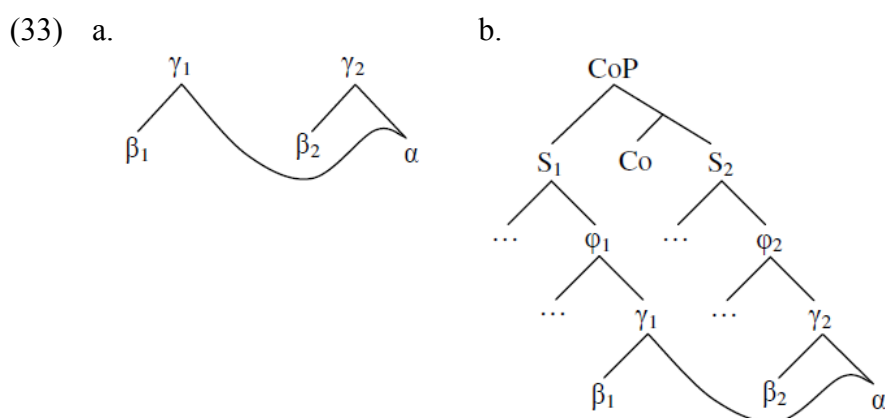
- (32) *Symmetry constraint*⁸⁵
If two hands move simultaneously, they have to be specified for the same handshapes and movement.

Since simultaneous realization of THINK and IX would violate this constraint, the second tier is not perfectly aligned with the first one. The same constraint actually causes the hold to be realized as a hold (31iii): otherwise two hands would be moving independently throughout the whole utterance.

Example (15) seems to contradict this generalization: the beginnings of signs CL:CARRY₁ and CL:CARRY₂ are synchronized. However, within this construction the phonological constraint in (32) is not violated, because both signs contain the same handshape and movement. Therefore, the full synchronization is possible.

6.6.3.3 Multi-rooted structures

As De Vries (2009) noted, structures such as those in (30) and (29), namely multi-rooted trees, cannot be linearized by the standard linearization procedure, because it is not possible to define where the traversing starts. In order for linearization to apply, the sub-trees created by External Remerge should be merged together at some point to form a single-rooted tree. The most straightforward way to change a multi-rooted structure is coordination. In (19) the object *Bush* is dominated both by *John admires* and *Bill hates*. This would create a multi-rooted structure as in (33a), but due to coordination, the structure is single-rooted (33b) (De Vries 2009:361).



⁸⁵ Based on the *Symmetry Condition* from Battison (1978).

(35)

[RSL-s2-19]



STREET



STREET+EARLIER

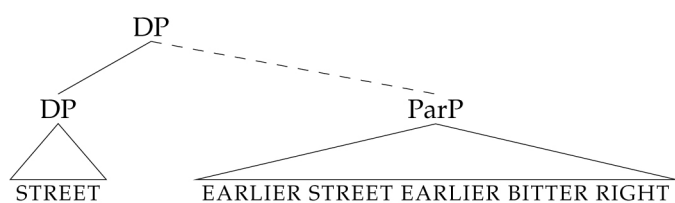


STREET+RIGHT

- h1: STREET-----
 h2: STREET GORKIY EARLIER STREET BITTER⁸⁷ EARLIER RIGHT
 ‘Gorkiy Street (earlier it was called Gorkiy, right)...’

The syntactic structure of (35) can be represented as (36). The DP STREET is parenthetically merged with the parenthetical phrase EARLIER STREET BITTER EARLIER RIGHT. Parenthetical Merge is represented with a dashed line in this structure.

(36)



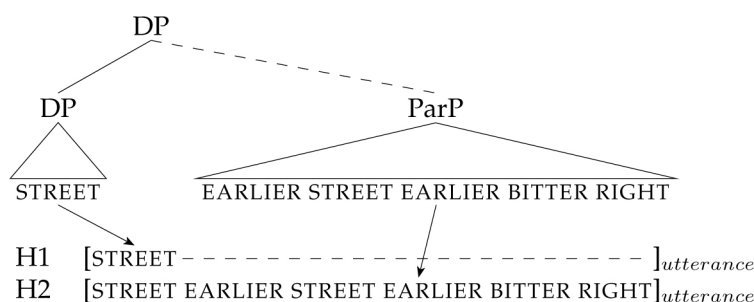
‘Gorkiy Street (earlier it was called Gorkiy, right)...’

The rule for linearization of Parenthetical Merge can be formulated as in (37). Note that the phonological constraint in (32) predicts the realization of the last element of the main sentence as a hold.

- (37) *Spell-Out of Parenthetically Remerged Nodes in RSL and NGT*
 Spell out the Parenthetical Phrase on the second tier.

If we apply this rule to sentence (35), the linearization can be visualized as in (38). STREET is first linearized on both hands because it is a two-handed sign, but then linearization of a parenthetically merged phrase demands the activation of the second tier, while STREET is realized as a hold.

(38)



⁸⁷ Gorkiy means ‘bitter’ in Russian.

There is a crucial difference between the rules of linearization for External Rmerge and for parentheticals. In the former case, the rule concerns one node, which is realized on the second tier as a weak hand hold. In the latter case, the rule concerns the whole parenthetical phrase, which is realized as a normal phrase, creating a hold on the other tier due to the phonological constraint. This difference also results in the difference in alignment: in the case of External Rmerge, there is a full alignment of the utterances on the two tiers, while in the case of parentheticals, the second tier becomes de-activated immediately when the parenthetical phrase ends (39).

- (39) a. *Alignment of tiers with External Rmerge in RSL and NGT*
 h1 [main clause-----]utterance
 h2 [hold-----]utterance
 b. *Alignment of tiers with Parenthetical Merge in RSL and NGT*
 h1: [main clause-- [hold-----]-----]utterance
 h2 : [parenthetical]utterance

Finally, the current analysis makes no clear predictions for the amalgams which contain both a shared node created by External Rmerge and a parenthetical, because it is impossible to satisfy the rules of realization for both in the same structure. One possibility is that amalgams are just not realizable in RSL and NGT, but another possibility is that one of the linearization rules (28) and (37) will override the other. Further research is needed.

The most important theoretical consequence of this subsection is that RSL and NGT show an overt distinct realization of Parenthetical Merge which confirms the status of this operation as distinct from other kinds of Merge.

6.6.4 Discussion

In the previous sections, a multidominant analysis of weak hand holds in RSL and NGT has been proposed. This analysis aimed to achieve descriptive adequacy, however, it also makes some predictions that could be tested in future research.

If the analysis is correct, then effects parallel to those in spoken languages should be observed in RSL and NGT as well. For instance, island effects should be absent in cases like (20), and parentheticals should be insensitive to c-command. In the corpus analysed here there were no clear examples confirming these expectations, so it needs to be tested in future research. Most importantly, the current analysis predicts the constraints on the use of weak hand holds. Leaving aside phonetically motivated holds, all multidominant and parenthetical structures and only they should produce holds in RSL and NGT. Again, the limited corpus size does not allow testing this prediction fully. However, examples similar to Right Node Raising, appositives and non-restrictive relative clauses can easily be constructed in RSL or NGT involving a weak hand hold.

Another prediction concerns the ordering of elements: it is expected to be different in RSL than in spoken languages. For instance, a translation of (19), which is an example of Right Node Raising, into RSL is likely to look like (40). Since linearization rules are different for RSL, the shared node is not expected to appear in the right-most position, but only on the second tier.

- (40) h1: BILL----- ADMIRE JILL HATE
 h2: BUSH IX-----
 ‘Bill admires, but Jill hates Bush’

RSL and NGT also have some other weak hand holds that have not been discussed here. For instance, these languages, as many other sign languages, use the so-called list buoys (Liddell 2003), when the fingers of the weak hands are used to list referents. It is possible to analyse this case as an instance of multidominance as well: the list buoy can be an overt realization of the shared scene-setting topic. This is also an argument in favour of the structure proposed for (15).

Another very common type of weak hand hold is a hold to mark background in locative construction. Pfau and Aboh (2012) analyse this kind of hold as prosodic, but this might be another instance of a multidominant structure. As for the syntactic holds, mentioned in section 6.3, it does not look likely that they can be analysed as involving multidominant structures. Further research is needed here.

Finally, note that the linearization rule in (28) only handles structures that result from External Remerge. It is interesting to see in future whether Internal Remerge can lead to the activation of the second tier, too. It has been claimed that *wh*-words are sometimes realized as weak hand holds (Conlin et al. 2003). A small amount of such examples has been found in our data, as well (section 6.3). This might mean that the rule in (28) has to be revised in order to include both types of remerge.

One important theoretical consequence of the analysis proposed here is that the modality difference between signed and spoken languages is fully localized in the linearization procedure and further prosodic alignment rules, while the syntactic analysis is equally applicable to both modalities. This is a desired result, because differences in linearization are unavoidable given the different articulators, while differences in syntax are less expected.

7. Discussion and conclusions

The last chapter of this dissertation combines two things that are often separated: the discussion of our results and the conclusions. We first recapitulate the findings reported in the empirical part of the dissertation represented by chapters 3-6, before turning to a discussion of the theoretical implications of the findings. In sections 7.1 and 7.2, we primarily address the former goal, while sections 7.3-7.5 are fully devoted to the latter.

The general research questions were set out in section 1.5:

GQ1: How is IS expressed in RSL and NGT?

GQ2: What are the similarities and differences between RSL and NGT in this domain?

GQ3: What are the typological implications of the RSL and NGT data?

GQ4: What modality effects can be identified in the domain of IS in RSL and NGT?

This chapter will address these questions one by one. In section 7.1, we summarize the main results of the dissertation with respect to GQ1, and in section 7.2, we compare RSL and NGT with respect to the markers of IS that we were able to identify (GQ2). In section 7.3, typological implications of the results are discussed (GQ3). Modality effects in the domain of IS are addressed in section 7.4 (GQ4). Finally, in section 7.5, we suggest directions for future research based on the current findings.

7.1 Summary of the empirical results

At the outset of the dissertation we took a methodological decision to approach the research question – how IS is expressed in RSL and NGT – from two perspectives. On the one hand, we have focused on the traditional notions of topic and focus and how they are expressed in these two languages. On the other hand, we have analysed two strategies that have been associated with IS functions in other sign languages, namely doubling and weak hand holds. Doubling turned out to be indeed closely related to IS, while weak hand holds were shown to fulfil a large variety of functions, only some of which are related to IS. In this section, we summarize the results reported in this dissertation that are directly related to IS (GQ1), structuring the discussion around the two IS categories of topic (section 7.1.1) and focus (section 7.1.2). Properties of weak hand holds that are not related to IS are not repeated here; the reader is referred to chapter 6 for the details.

In addition, in the last subsection (7.1.3) we briefly discuss some practical outcomes of this study, namely the creation of a small corpus of RSL collected and annotated for this project, annotations created for some files from Corpus NGT, and the collection of question-answer pairs in both languages.

7.1.1 Topics

In chapter 1, we noted that, based on spoken language data, several types of topics have to be distinguished. The discussion in chapter 2 revealed that the same is true for sign languages. In particular, a difference should be made between aboutness topics, scene-setting topics, and

discourse topics. In chapters 3 and 6, based on corpus data, we found out that these notions are also relevant for RSL and NGT.

Both sign languages use syntactic and prosodic markers for aboutness and scene-setting topics. These two types of topics are marked in a similar way, but, just as in spoken languages, they can be distinguished functionally: aboutness topics specify the referent that the sentence is about, while scene-setting topics set up a time and place for the situation described in the sentence. As for syntax, both types of topics are characterized by sentence-initial position in both languages. For instance, in (1a-b) the scene-setting topics THEN and FOURTH, as well as the aboutness topics IX and IX CAT appear sentence-initially. The examples also reveal that scene-setting topics generally precede aboutness topics. In addition, NGT has a strategy of topic copying, previously described as topic agreement in Crasborn et al. (2009), whereby the topic is repeated in the form of a pronoun at the end of the sentence, as the topic IX-1 in (1c). Some less common strategies of topic marking involve the combination of a topic with an unmarked pointing sign, the simultaneous realization of the topic and the comment, and the occasional use of the PALMS-UP sign accompanying a topic (see section 3.3.1 for examples).

- (1) a. bht
[THEN]_{sst} / [IX]_{top} / GO [NGT-1712-71]
'Then he goes away.'
- b. bht
[FOURTH]_{sst} / [IX CAT]_{top} / LOOK [RSL-cr8-19]
'In the fourth story the cat looks.'
- c. [IX-1]_{top} DARE [IX-1]_{top} [NGT-4-3]
'I dare.'

Both aboutness and scene-setting topics in RSL and NGT can be marked non-manually, in particular by eyebrow raise and backward head tilt (2). We found that these markers are only used in combination with shifted aboutness topics. But even if topics are not clearly marked non-manually, they are usually separated from the rest of the utterance by a prosodic break, realized either as a pause or as a change in non-manual behaviour (so that the topic itself is not marked non-manually, while the rest of the sentence is).

- (2) a. er+bht
IX CAT IX THINK [RSL-cr8-12]
'The cat thinks.'
- b. er
IX CANARY TURN [NGT-1773-73]
'The canary turns.'
- c. er
IX WALL WATER PIPE [RSL-cr6-12]
'There is a water pipe on the wall.'

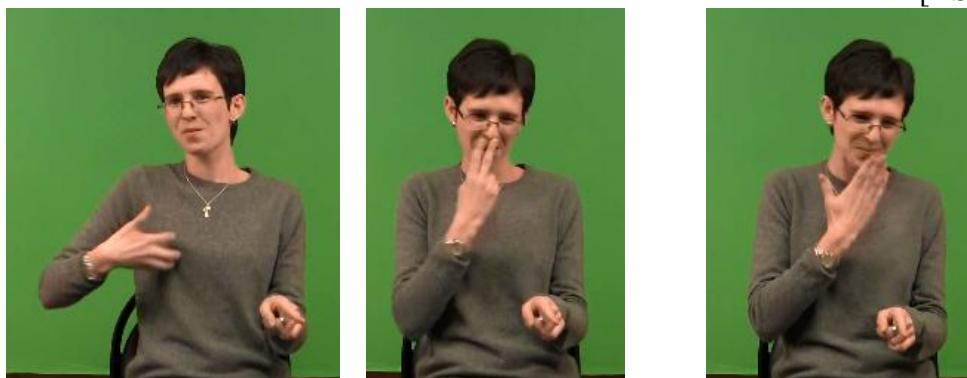
It also became clear from our analysis that topics are very often elided. Indirectly, ellipsis is related to the third types of topic, namely discourse topics. A discourse topic can be identified if the topic is the same in several sentences within an episode. This is exactly the context in which topics are likely to be elided. However, there is also a more explicit marker of discourse topics, namely weak hand holds.

As we discussed in chapter 6 in detail, weak hand holds are a very common phenomenon in both RSL and NGT, and they fulfil a variety of functions. One of these functions is to

emphasize a discourse topic. The sign referring to the topic – most typically a pointing sign – is held throughout several sentences, as is true for the sign IX in (3), referring to the discourse topic ‘cat’.

(3)

[RSL-cr4-10]



MONKEY+IX

LOOK+IX

NICE+IX

h1: THINK MONKEY. LOOK. NICE.

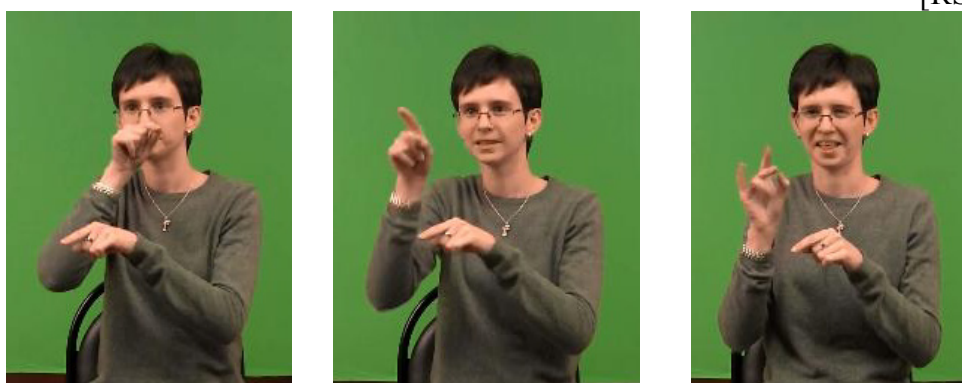
h2: IX-----

‘She thinks it is a monkey. She looks at it. It is nice!’

Another discourse function of weak hand holds is probably also related to discourse topics, but in this case, the weak hand hold is not emphasizing the discourse topic, but rather establishing it. We used the term “anchoring a referent” to describe a situation in which a pointing sign is held while a new important referent is introduced into the discourse, as in (4), where the important referent CANARY is being established in space and accompanied by such a hold.

(4)

[RSL-cr1-10]



CANARY+IX-a

IX-b+IX-a

K-A-N-A-R-E-Y-K-A+IX-a

h1: APPEAR CANARY IX-b K-A-N-A-R-E-Y-K-A

h2: IX-a-----

‘There appears a canary.’

Finally, weak hand holds sometimes signal a topic-comment relation between sentences. In this case, the first sentence functions as a special aboutness topic, and the second sentence comments on this topic, while the last sign of the first sentence is held. This is illustrated in (5), where the content of the second sentence is a comment on the situation described in the first one.

(5)

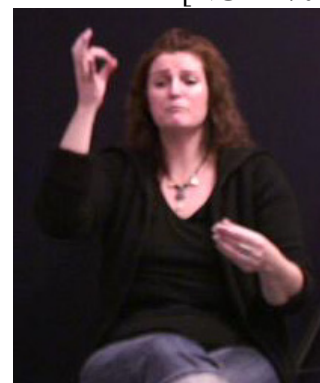
[NGT-170-10]



OVER



FINALLY+OVER



OUT+OVER

h1: NOW IX OVER. IX FINALLY MAY OUT

h2: OVER-----

‘Now it was over. So he finally was allowed to go out.’

To sum up, in both RSL and NGT topics of all types are often marked. To that end, both languages employ a variety of strategies: syntactic marking, prosodic (domain and boundary) marking, and manual simultaneity (weak hand holds).

7.1.2 Focus and foregrounding

Remember from the discussion in section 1.4 that focus in some form is supposed to be a universal pragmatic category; the form of the marking, however, may differ from language to language. In section 2.3, we have seen that there are also some typical markers of focus in sign languages, reminiscent of the markers known from spoken languages. Chapter 4 demonstrated, based on an elicitation study, that contrastive and non-contrastive focus in RSL and NGT is marked by a variety of syntactic, manual prosodic, and non-manual prosodic markers – used singly or in combination. In addition, chapter 5 described one of the potential markers of focus, namely doubling, in more detail based on corpus data.

Syntactic marking of focus in RSL mainly involves ellipsis and doubling. Ellipsis, not being a marker of focus per se, is related to focus, as the focused parts are never elided, while the rest of the sentence often is. This indirect marking of focus has been observed in both RSL and NGT, although in our data, NGT uses it more often than RSL.

Doubling also appears to be related to focus in both languages. In particular, verbal doubling often appears in sentences with VP focus (6a), sentence focus (6b), and verbal focus (6c). As we have seen in the elicited data, it is not the whole focused constituent that is doubled, but only a part of it, namely the verb in examples (6), which can be seen as instantiation of the phenomenon of focus projection.

- (6) a. GIRL [KISS BOY KISS]_{FOC} [RSLf-13-12]
 ‘The girl kisses the boy.’
- b. [CAR CL:CRASH TREE CL:CRASH]_{FOC} [RSLf-23-30]
 ‘A car crashed into a tree.’
- c. MAN [EYE.CLOSE SIT EYE.CLOSE]_{FOC} [RSLf-38-10]
 ‘The man closed his eyes.’

When looking at the corpus data, we noticed that doubling is not constrained to verbs; rather, all types of syntactic constituents (subject, objects, nouns within noun phrases, clauses, etc.) can be doubled. For example, in (7) the noun FOREST is doubled within the noun phrase [FOREST BEAUTIFUL FOREST]_{NP}. In addition, as we have seen above in (1c), topics in NGT can be doubled, too.

- (7) FOREST BEAUTIFUL FOREST AROUND [NGT-92-2]
 ‘There is a beautiful forest around.’

We came to the conclusion that doubling has a function related to focus, but orthogonal to it, namely foregrounding of information. Hence, for instance in (6a), the verb EYE.CLOSE is doubled because it contains the most relevant information, while the verb SIT, although it is also a part of focus and new information, does not directly answer the question and is therefore less relevant. Foregrounding is not restricted to focus: topics can also be foregrounded. The same explanation therefore applies to topic copying in NGT (1c), as only the topics relevant for further discussion can be doubled.

We have to acknowledge however that this analysis does not account for all instances of doubling. In the RSL data, for instance, we find examples like (8) where the verb KISS is doubled, although the focus is on the object. We hypothesize that in such cases doubling has lost its pragmatic function in the course of grammaticalization (Pfau and Steinbach 2011). However, further analysis is needed to fully account for this type of example.

- (8) KISS [FATHER]_{FOC} KISS [RSLf-11-1]
 ‘She kisses her father.’

The most common markers of focus in both languages are manual prosodic markers, that is, modification of movement and location of the sign in focus in comparison to the non-focused version of the same sign. In both RSL and NGT, focused signs can be longer, slower, larger, and higher, and may contain more repetitions than their non-focused counterparts. In some cases, these markers also interact with the type of focus and with the type of movement in the focused sign, so that, for instance, signs with hand-internal movement are less likely to be larger in articulation when in focus.

Finally, as previously described by Crasborn and van der Kooij (2013), focus in NGT is often marked non-manually. In particular, it can be marked by eyebrow raise (9a) and backward head tilt, head nods (especially for contrastive focus (9b)) and forward body leans. Mouthing and eye gaze direction can be associated with focus as well. In particular, signs in focus are more likely to be accompanied by mouth actions and by the eye gaze at the addressee. However, both mouthing and eye gaze are probably the default behaviour both in focus and not in focus, so they cannot be considered focus makers.

- (9) a. er
 [CAGE CL:CARRY]_{FOC} [NGT-2079-84]
 ‘He carries the cage.’
 b. sn
 CANARY CANARY2 [NGTf-12f3]
 ‘(The girl plays with) a canary.’ (selective focus)

In contrast, RSL uses non-manual markers of focus much less. Eyebrow movements and head tilts are never observed in the data; head nods and body leans are rarely used, and their

appearance is restricted by the type of focus and the focus domain; mouthing shows some association with focus, while eye gaze direction does not.

In addition to the markers of focus, in both languages sideward body leans (10a) and dominance reversals (10b) are used to mark contrast. Interestingly, the body leans (unlike other non-manual markers) spreads across both topical and focal parts of sentences, thereby presenting an argument in favour of analysing contrast as a notion separate from focus.

- (10) a. $\frac{\text{CAT [BITE BOY]}_{\text{FOC}}}{\text{lbl}}$ $\frac{\text{IX DOG [BITE GIRL]}_{\text{FOC}}}{\text{rbl}}$ [RSLf-25-10]
 ‘The cat bites a boy. The dog bites a girl.’
- b. h1: $\frac{\text{CAT BITE}}{\text{rbl}}$ h2: $\frac{\text{DOG BITE}}{\text{lbl}}$ [NGTf-26-f10]
 ‘The cat bites (the girl) and the dog bites (the boy).’

7.1.3 Other results of the project

This project had multiple goals. We wanted to describe IS marking in RSL and NGT, based on naturalistic data, and to compare the languages to each other; in addition, our aim was to contribute to the theoretical and typological discussion of IS. Finally, yet another purpose of this project was to collect and annotate RSL and NGT data that can be used in future research by other researchers.

In the course of this project, we have collected a small corpus of RSL: two hours of narratives signed by 12 signers. The whole corpus has been annotated with sign-by-sign glosses and clause-level translation (in Russian and English), with the help of native signers. Half of the corpus used to study topic (chapter 3) and weak hand holds (chapter 6) has been annotated on multiple tiers, including annotation of non-manuals, weak hand holds, and IS categories.

The NGT data from Corpus NGT had been partially glossed before; however, in the course of this project, annotations have been added, including annotations for Canary Row stories which had not been glossed before. These video-recordings and annotations can now be used for other projects, not necessarily related to IS. The RSL corpus will be made available on-line to interested researchers in the near future; hopefully researchers from Russia and other countries will benefit from it.

In addition, for the study of focus described in chapter 4, question-answer pairs have been collected by means of elicitation materials that were created for this purpose. The data contains recordings from ten RSL and ten NGT signers. This data can also be made available on request to other researchers. Although this is a much less general data set, it still can be used in future research on focus in these languages. In section 7.5, we make suggestions for some such possible research projects.

7.2 Intra-modal typology: comparison between RSL and NGT

In this section, we discuss the differences between RSL and NGT in the domain of IS (GQ2). As discussed in the beginning of this dissertation (section 1.2.1), sign languages are not all the same, and a comparison of two sign languages is of great interest. Sections 7.2.1–7.2.4 are devoted to differences in topic marking and focus marking strategies, as well as the use of doubling and weak hand holds, respectively. Section 7.2.5 summarizes the findings.

7.2.1 Topic marking

Topic marking in RSL and NGT shows a lot of similarities. As recapitulated in section 7.1, topics are marked by syntactic, non-manual prosodic, and boundary prosodic means. Most of the topic markers have the same form and function in a similar way in the two languages. However, we were able to identify one interesting syntactic difference.

In particular, NGT uses the strategy of topic copying, whereby a sentence-final pronoun refers back to the topic of the sentence, while RSL does not use this strategy in the data analysed here. Note that the RSL data set is quite small, so it is not possible to exclude the existence of this strategy. In fact, there are some indications that a similar strategy is available in RSL. Zeshan (2006:42) reported that sentence-final pronouns exist in RSL as a strategy of marking questions (11). Nevertheless, even if this construction exists in RSL, it is clearly not used as a common marker of topics, unlike in NGT.

- | | | |
|------|---|-------|
| | <u>wh-question</u> | |
| (11) | IX-2 WORK IX-2 | [RSL] |
| | ‘What do you do?’ (adapted from Zeshan 2006:42) | |

The lack of more significant differences between RSL and NGT in this area is quite surprising. Note, however, that potential subtle phonetic differences between non-manual markers of topics in RSL and NGT, such as reported for instance in Dachkovsky et al. (2013), have not been analysed in this study. In addition, remember that many different sign languages – including ASL, Auslan, and HKSL – mark topics in a similar way: by the sentence-initial position, by raised eyebrows and by head tilts, and by a prosodic boundary following the topic (Sze 2011). RSL and NGT therefore follow a pattern common for sign languages.

7.2.2 Focus marking

As discussed in chapter 4 and in section 7.1, focus marking, in contrast to topic marking, shows some interesting differences between RSL and NGT. It is not clear whether this difference is a typological trend or whether it is surprising – we are not aware of typological research that directly compares cross-linguistic variation between topic marking and focus marking.⁸⁸

In section 4.8.3, we presented a table listing all differences between the languages in the domain of focus marking that we were able to identify. For the reader’s convenience, this table is repeated here as table 7.1.

Table 7.1 clearly shows that differences in focus marking between RSL and NGT exist at all levels: syntactic, manual prosodic and non-manual. However, the differences on the syntactic and manual prosodic levels are quantitative. In particular, ellipsis is more common in NGT, but it is of course also used in RSL. With respect to manual prosodic markers, we found that all markers are used in both languages, but there were differences concerning the interaction of individual markers with focus types and types of movement. We do observe a more noticeable difference in non-manuals: they are used often to mark focus in NGT, but barely in RSL (with the exception of sideward body leans used to mark contrast in both languages).

⁸⁸ Note, however, that focus marking has been studied in greater detail than topic marking in this dissertation. Manual prosody has not been studied for topics at all; also, for focus many non-manuals have been analyzed.

Table 7.1. Differences in focus marking between RSL and NGT.

Domain	Marker	RSL	NGT
Syntax	<i>Ellipsis</i>	used less	used more; differences between focus types
	<i>Focus particles</i>	no	SELF – (emphatic) focus particle
Manual prosody	<i>Length</i>		differences between focus and movement types
	<i>Repetitions</i>	used more; differences between movement types	used less
	<i>Speed</i>		differences between movement types
	<i>Size</i>	less often, differences between focus types and movement types	more often, differences between movement types
	<i>Height</i>	differences between focus types and movement types	
Non-manuals	<i>Eyebrow</i>	not used	used
	<i>Head tilt</i>	not used	used
	<i>Head nods</i>	only for Selective Focus	all types of focus
	<i>Eye gaze</i>	no association with focus	some association with focus

The comparison thus shows that, apart from non-manual marking, RSL and NGT use the same strategies of marking focus. Speaking quantitatively, in both languages, the most important strategy is to use manual prosody; that is, RSL and NGT use the same tools, but still show subtle differences. As discussed in chapter 2, there is little research on focus in other sign languages; it is therefore difficult to put RSL and NGT into perspective. Note, however, that ASL also uses syntactic, manual prosodic, and non-manual markers of focus (Wilbur 2012), thereby showing considerable overlap with NGT, and at least some similarity with RSL, in this domain.

7.2.3 Doubling

Doubling in RSL and NGT again in general follows the same pattern. In chapter 5, we offered a unified account of doubling as a foregrounding strategy in both languages. However, some differences are present as well. As already discussed in section 7.2.1, topics are only doubled in NGT in our data. Another difference concerns the distribution of types of doubling in narratives.

In section 5.3.3, we discussed that RSL and NGT are different with respect to the proportion of verbal and clausal doubling. We only analyzed Canary Row stories to ensure comparability of the data, and came to the conclusion that RSL uses verbal doubling more often than NGT, while in NGT clausal doubling is significantly more common. We hypothesized that RSL might be further on the grammaticalization path of the doubling strategy than NGT. The fact that verbal doubling has been found in sentences with object focus in RSL may be another instantiation of the same phenomenon. These cases are probably the most grammaticalized ones, as here doubling does not have the pragmatic function of foregrounding.

To sum up, it is clear that doubling has similar functions and also similar formal properties in both languages; it most likely has the same origin and follows the same grammaticalization path. On the other hand, there are clear grammatical differences and also differences with respect to the frequency of different doubling types.

Although there is quite a lot of research on doubling in sign languages, due to methodological differences, it is difficult to put the RSL and NGT data into perspective. In particular, pronoun doubling, which has been described for such languages as ASL and LSB (Nunes and de Quadros 2008), is not analysed as topic copying, but as subject copying; so it is not clear whether NGT follows the same pattern. In addition, quantitative data on the distribution of different doubling types is not available for other sign languages; furthermore, clause doubling is usually ignored (see Cumberbatch 2013 for an exception). Despite these methodological problems, we can still conclude, based on the available literature, that doubling patterns are strikingly similar across many sign languages. We return to this issue in sections 7.3 and 7.4.

7.2.4 Weak hand

Finally, as chapter 6 shows, the use of weak hand holds is also quite similar in RSL and NGT. In the domain of IS-marking, the same functions of holds can be found in both languages. The corpus does not allow us to determine whether there are any differences in the frequency of IS-related holds.

However, there is an overall difference in the frequency of holds between RSL and NGT. Even when controlled for the possibly interfering factors, RSL uses weak hand holds significantly more frequently than NGT. Whether this difference is relevant for IS holds as well is a question for future research.

Again, despite the fact that there is considerable research on weak hand holds in other sign languages (Vermeerbergen et al. 2007), a direct comparison between them and RSL and NGT is not possible, because of differences in methodology and with respect to the definitions of weak hand holds. Impressionistically, IS-related holds such as those we identified in RSL and NGT are also present in other sign languages for which holds have been described. In general, we did not find any specific types of holds that would be unattested in other sign languages.

7.2.5 How different are RSL and NGT?

The discussion in the preceding sections reveals that in the domain of IS RSL and NGT look very similar to each other. However, this is not unexpected. Therefore, it is the differences, be they qualitative or quantitative in nature, that we are primarily interested in. Let us first focus on the qualitative differences.

A qualitative difference implies that one language uses a strategy that is not available in the other language. One such difference is the topic-copying strategy, which is quite common in NGT, but not present in RSL in the data analysed here. Another such difference is the use of some of the non-manual markers of focus, such as eyebrow raise and backward head tilts, which again are only attested in NGT.

In principle, qualitative differences can be a basis for typological classification. It might be the case that sign languages can be divided into those which have topic doubling and those which do not (figure 7.1).

As discussed in section 1.4.2, Gundel (1988) conducted typological research on IS and found several universals in the domain of topic-comment structure. One of the generalizations she formulated is that every language in her sample had a construction in which the topic is left-adjoined to a full sentence comment, and also that every language had a construction in which the topic is right-adjoined to a full sentence comment. RSL and NGT obey the first generalization: many examples discussed in chapter 3 can be described in the terms of a topic being left-adjoined to a full sentence comment, as in (12), where the topics are placed to the left of full sentences.

- (12) a. bht
IX-1 / INSIDE **IX-1** FUNNY LAUGH [RSL-s2-10]
 ‘I am laughing inside.’
 b. bht
IX-1 PU / **IX-1** LOOK.AROUND [NGT-208-11]
 ‘I look around.’

However, the second generalization does not seem to hold based on our data. We did not find right-adjunction of topics in RSL or NGT. Of course, it might be the case that we misanalysed some of the data due to a lack of strict criteria for identifying sentence boundaries. For instance, whenever we encountered the following sequence: S_1 T S_2 (where S_1 and S_2 are full sentences, and they share the topic T), we analysed it as an instance of T being left-adjoined to S_2 , not right-adjoined to S_1 . Further research is needed to establish reliable criteria for the identification of sentence boundaries in RSL and NGT (Crasborn 2007, Ormel and Crasborn 2012), and this might also well lead to the discovery of right-adjoined topics.

Gundel (1988) also found that every language had a construction to place a topic before the comment, without left-adjoining it to the full comment sentence, and that was true for both old and new topics. Moreover, every language also had a construction to place an old topic after the comment. Again, the first part of the generalization is confirmed by numerous examples discussed in chapter 3, including (2), but the second part is not confirmed, probably for the same reasons discussed in the previous paragraph.

Another generalization that Gundel reached based on her sample is that every language had a cleft construction to mark the IS. As we briefly mentioned in chapter 3, RSL and NGT also have a construction similar to what has been analysed as a *wh*-cleft in other sign languages (Wilbur 1996) (13). However, as we discuss further in section 7.4, this construction has been argued to be different from clefts in spoken languages (Caponigro and Davidson 2011). Disregarding the latter analysis for the time being, it is possible to argue that RSL and NGT also obey this generalization.

- (13) er+bht
IX WHO DRIVE / OBVIOUS BIRD SELF DRIVE [NGT-27-3]
 ‘Who drives it [the tram], is the bird itself.’

Another point where RSL and NGT data become typologically relevant is the case of scene-setting topics. As mentioned in chapter 1, many researchers do not analyse scene-setting topics as topics; for instance, Krifka (2008) used the term “frame settings” to describe this phenomenon. He stated that frame settings are not aboutness topics, but acknowledged that they share some properties with contrastive topics. On the other hand, some researchers do subsume both aboutness and scene-setting topics under the general category of topics, because the two types share both semantic and morpho-syntactic characteristics (Jacobs 2001, Sze 2008). The RSL and NGT data analysed here can be used as

an argument in favour of the latter approach, as both types of topics are also marked by the same syntactic and intonational markers in these languages. For instance, in (14a,b) the aboutness topic CANARY and the scene-setting topic IX WALL are marked by eyebrow raise.

- (14) a. $\overset{\text{er}}{\text{IX CANARY TURN}}$ [NGT-1773-73]
 'The canary turns.'
- b. $\overset{\text{er}}{\text{IX WALL WATER PIPE}}$ [RSL-cr6-12]
 'There is a water pipe on the wall.'

Finally, RSL and NGT have a separate strategy to mark discourse topics (van Dijk 1976, Shiffrin 1994), namely weak hand holds, which may be a modality-specific phenomenon. Discourse topics are of course relevant in most languages; they are indirectly responsible for pronominalization and argument omission and for coherence of the text. However, to our knowledge, spoken languages do not have overt markers of discourse topic. Sign languages, on the other hand, exploit the possibilities made available by the visual modality to express the discourse topic simultaneously with the relevant part of discourse.

7.3.1.2 Topic prominence

As already mentioned in chapters 1, 2 and 3, sign languages have been a part of the discussion of topic prominence for quite a while now. Section 3.6 was devoted to the issue of topic prominence of RSL and NGT, so here we only briefly recapitulate the main points.

The notion of topic prominence goes back to Li and Thompson (1976), who classified languages into four categories according to the role topics and subjects play in their grammar: topic-prominent, subject-prominent, both topic- and subject-prominent, and neither topic- nor subject-prominent. Most importantly, they claimed that topic-prominent languages have some shared typological characteristics, besides having topic as a grammatical notion. For instance, such languages do not have passives, they are typically SOV, they have double-subject constructions, and they have obligatory surface coding of topics. More recently, É. Kiss (1995) defined topic prominence with the help of a single criterion: topic-prominent languages obligatorily distinguishthetic and categorical sentences syntactically. Some researchers also associate topic prominence with ellipsis (Gundel 1988, McShane 2005). Finally, Surányi (to appear) argued that the notion of topic prominence may be more gradable; for instance, he suggested distinguishing weakly and strongly topic-prominent languages.

Some sign languages have been claimed to be topic-prominent (Jantunen 2007, Rosenstein 2011), but a recent discussion in Sze (2008) casted doubts on the correctness of the criteria used as a basis for this claim. Sze (2008) discussed the criteria from both Li and Thompson (1976) and É. Kiss (1995) and came to the conclusion that typologically only three properties characterize topic-prominent languages: obligatory surface coding of topics, lack of restriction on what constituents can be topics, and a prevalence of double-subject constructions.

As we have shown in chapter 3, although RSL and NGT have surface coding of both topics (quite unrestricted) andthetic sentences, this coding is optional; that is, in many cases, the topic-comment structure of the sentence is not specified. Double-subject constructions are present, but not prevalent in these languages. We thus concluded that RSL and NGT cannot be considered topic-prominent according to the strict definitions offered by Sze (2008).

However, we also noted that both RSL and NGT have elaborate markers of topics and thetic sentences, and make extensive use of ellipsis. We argued that the RSL and NGT facts hint on the necessity to further discuss of the notion of topic prominence. It is clear, for instance, that IS in general (and topic marking in particular) plays a significant role in the grammar and use of RSL and NGT; yet, these languages cannot be called topic-prominent. Maybe more gradations of topic prominence should be used to classify languages (as suggested in Surányi to appear); or maybe the notion of topic prominence in general should be decomposed into several parameters, such as: surface coding of topics, surface coding of thetic sentences, ellipsis, and so on, and these parameters should not be categorical either, in order to avoid proposing major typological classes such as topic-prominent vs. non-topic-prominent languages.

This would imply that topic prominence (and discourse-orientation in general) can be a scalar rather than a categorical distinction. Figure 7.3 is a visualization of this suggested scale. On this scale, Russian is more topic-prominent than NGT and RSL, because, impressionistically, word order is more free in it. HKSL is less prominent, because it lacks a special marking of thetic sentences.



Figure 7.3. Possible typological classification III: A scale of topic prominence in spoken and sign languages

7.3.2 Focus in typological perspective

7.3.2.1 General properties of focus marking

There is a huge body of research on focus, including typological and theoretical studies. As it is impossible to discuss all the results obtained in this area, we will focus on some generalizations. Zimmermann and Onea (2012) claimed that IS in general, and focus in particular, is a universal phenomenon, but that the linguistic means of expressing focus are different cross-linguistically. As is the case with topics, focus can be expressed syntactically, prosodically (by accenting or prosodic phrasing), and morphologically. RSL and NGT again fit neatly into the typological picture, as they express focus through syntactic (doubling and ellipsis) and prosodic (manual prosody and non-manuals) means. We have not found morphological markers of focus in RSL and NGT, but such markers are quite rare in spoken languages as well.

Zimmermann and Onea also noticed that focus marking rarely marks focus exactly in any natural language. One example of underspecification of focus marking is the phenomenon of focus projection, discussed in section 4.8.2. For instance, in English, if the main sentence accent falls on the object, this can either express focus on the object, on the VP, or on the entire sentence. Zimmermann and Onea argued that this underspecification of focus marking is to be expected, as focus is not a linguistic, but a cognitive category. As we have seen in chapter 4, focus in RSL and NGT is also sometimes underspecified: manual prosodic marking on the verb can express both verb (15a) and VP focus (15b,c), and also verbal doubling applies to VP-focus.

- (15) a. WOMAN [TAKE.PICTURE]_{FOC} [RSLf-36-20]
 ‘The woman takes pictures (of the flowers).’

- b. BOY [CL:FIX BIKE]_{FOC} [RSLf-21-16]
 ‘The boy fixes the bike.’
- c. BOY [BIKE CL:FIX]_{FOC} [NGTf-21-f4]
 ‘The boy fixes the bike.’

In addition, Zimmermann and Onea provided two typological generalizations. One generalization states that subject focus is generally more marked than other types of focus. Empirically this generalization is based on a study of Chadic languages, which always unambiguously mark subject focus, but do not mark other types (Fiedler et al. 2010). Theoretically this asymmetry is explained by the fact that subjects are prototypical topics, while the VP is usually the focus. Consequently, languages tend to omit any markers when these prototypical roles are fulfilled; however, if the subject becomes focus, it has to be marked.

We have not found much confirmation for this hypothesis in RSL or NGT. There were no differences in manual prosodic markers between subject, object and verbal focus – all syntactic roles are equally likely to be marked. Non-manual markers show some differences across syntactic roles, but the differences do not always follow the generalization made above. In particular, in NGT, head nods do follow the hierarchy $S > O, V$ (so the subject focus is the most marked), but backward head tilt is mostly used to mark object focus, and body tilts are combined with verbs; in RSL, head nods are used with subject and object focus. Taken together, there is no clear confirmation for a tendency to mark subject focus more than other domains. RSL and NGT are not exceptional in this respect; the generalization mainly holds for Chadic languages.

Another tendency that Zimmermann and Onea noted is for contrastive focus to be more marked than information focus cross-linguistically. For instance, contrastive focus tends to be marked by marked grammatical constructions and by stronger realizations of focus accents. We did not find much confirmation of this tendency in RSL or NGT either. In particular, some manual prosodic markers actually tend to be used more in combination with information focus than with contrastive (selective and corrective) focus (section 4.4). We found, however, that head nods are mainly used to mark contrastive focus in both languages, and we also found a special marking of contrast, namely body leans (sections 4.5-7). Thus, manual prosodic markers in RSL and NGT do not follow this tendency, while some non-manual markers do.

Another typological study, also discussed in section 1.4.3, is presented by Buring (2010), who argued that focus is universally expressed by prosodic prominence, but that this prominence can have different phonetic realizations, and a language may have different strategies to change the default prominence. As for the former distinction, some languages such as English use stress to express prominence, while others (such as Chichewâ) align the prominent constituent with a prosodic boundary. RSL and NGT obviously fall within the first category.

- (16) a. What did he hit the house with? [Chichewâ]
 (Anaményá nyumbá ndímwáála_F)pP
 hit house with rock
 ‘He hit the house with a rock.’
- b. What did he hit with a rock?
 (Anaményá nyumbá_F)pP (ndímwáála)pP.
 hit house with rock
 ‘He hit the house with a rock.’

- c. What happened? [Spanish]
 Juan compró ayer el periódico
 John bought yesterday the newspaper
 ‘John bought the newspaper yesterday.’
- d. Who bought the newspaper yesterday?
 ayer compró el periódico JUAN
 yesterday bought the newspaper John
 ‘John bought the newspaper yesterday.’

The latter distinction concerns the cases in which some constituent in focus has to receive prominence. Here Büring makes a distinction between boundary languages, which create a prosodic boundary to adjust prominence patterns, and edge languages, which move the constituent to a different position where it can receive prominence. Chichewâ would be of the former type, as a phonological phrase boundary (pP) is inserted to the right of the focus (F) in this language. For instance, in (16a) focus is on *ndimwáála* ‘rock’, so a prosodic phrase boundary follows this word; in (16b) focus is on *nyumbá* ‘house’, so a phonological phrase boundary is inserted immediately after this word. (Büring 2010:184). The same actually applies to English, where, according to Büring, the accent marks the head of a prosodic constituent; so, for instance, in order for the subject of a transitive sentence in focus to be marked by stress, a prosodic boundary is inserted. Spanish, on the other hand, does not change prosodic boundaries to mark focus, but the focused constituent is instead moved to a peripheral position to receive prominence there, as in (16c-d) (Büring 2010:190). Consequently, Spanish is classified as an edge language.

In chapter 4, we have seen that word order is hardly ever used to mark focus in RSL or NGT. For instance, focused objects do not move to the left periphery of the sentence (i.e. they are not topicalized, except for one or two examples), and they also do not always appear sentence-finally (17a-b). Focused subjects also do not seem to move from their base position (17c). Therefore, we have to conclude that RSL and NGT are boundary languages, in which a prosodic boundary is created to assign prominence to the focused constituents, as sketched in (17d), similar to Büring’s analysis of English and Chichewâ. However, a detailed analysis of the prosodic structure of RSL and NGT goes beyond the scope of this dissertation.

- (17) a. GIRL STRIKE [DOG]_{FOC} [RSLf-12-12]
 ‘The girl strikes the dog.’ – VO order
- b. [CANDY]_{FOC} EAT [RSLf-30-10]
 ‘He eats candy.’ – OV order
- c. [HORSE]_{FOC} DRINK [RSLf-31-1]
 ‘A horse drinks.’
- d. ([HORSE]_{FOC})_{PP} DRINK

7.3.2.2 Focus vs. contrast

Another important issue (introduced in section 1.4.3) is more of a theoretical, rather than a typological nature: the question whether contrast and focus are separate categories, or whether they are both subtypes of focus. The former approach is advocated, among others, by Vallduví and Vilkuna (1998) and Molnár (2001), while Krifka (2008) and Zimmermann and Onea (2011) are proponents of the latter approach.

There are some facts that argue in favour of analysing contrast as a separate notion, the main one being that some languages have markers of contrast which are different from

markers of (information) focus. One such language is Finnish, where the left-peripheral position is used only for contrasted constituents, both for contrastive foci and contrastive topics (Vallduví and Vilkuna 1998). Another example of such a language might be Russian, where the so-called *éto*-cleft construction (Kimmelman 2009c) is compatible only with contrastive focus (18a), but cannot be an answer to a wh-question (18b).

- (18) a. Vanja is on duty today. [Russian]
 Net, éto Petja segodnja dežurnyj
 No this Petja today on duty
 ‘No, Petja is on duty today.’
 b. [Who is on duty today?]
 # Éto Petja (segodnja dežurnyj)
 this Petja today on duty
 ‘Petja is on duty today.’

Nevertheless, languages which have a dedicated marker of contrast are rare, and some apparent cases of contrast markers turn out to be also compatible with information focus, as in Hausa (Hartmann and Zimmermann 2007). In most languages, contrastive focus is marked more than non-contrastive focus, but by the same grammatical means (Zimmermann and Onea 2011). In addition, there are theoretical reasons to analyse contrast and focus as a unified category, as they both involve comparing the focused constituent to a set of alternatives, as argued in the analysis proposed by Rooth (1992).

As discussed in chapter 4 and in section 7.1, RSL and NGT do have a dedicated marker of contrast, namely sideward body leans (and dominance reversal). These devices are never used to mark information focus; they also apply to both topics and foci, as example (10) shows. RSL and NGT thus present a strong argument in favour of analysing contrast as a separate category. However, both markers are clearly modality-specific (see also section 7.4), and it is therefore questionable whether, based on the existence of these markers, a category of contrast should be applied universally, that is, to spoken languages, too. On the other hand, in combination with the facts from Russian and Finnish, RSL and NGT form an important piece of evidence in favour of analysing contrast separately from focus.

7.3.3 Doubling in typological perspective

As discussed in section 2.4, verbal doubling is a phenomenon attested in many spoken languages, illustrated by the following list of geographically and typologically diverse languages provided by Cheng and Vicente (2008) (based on Kandybowicz (2006)): Akan, Basque, Brazilian Portuguese, Buli, Capeverdean, Caribbean English Creole, Chinese, Edo, Ewê, Fongbe, French, Guadeloupe, Gullah, Gungbe, Haitian Creole, Hausa, Hebrew, Hungarian, Igbo, Île de France Creole, Jamaican, Japanese, Korean, Krio, Mauritian Creole, Netherhollands, Nupe, Nweh, Papiamentu, Rodrigues Island Creole, Russian, Saramacan, Seselwa, Spanish, Sranan, Trinidad Dialect English, Turkish, Twi, Vata, Yiddish, Yoruba.

Kandybowicz (2007) concluded that the functions of verbal doubling are connected to IS: it typically marks polarity, emphasis and contrast. For instance, in Brazilian Portuguese, it marks polarity (Matrins 2007:87) (19a), and in Russian contrastive topics in combination with polarity (19b).

- (19) a. Ele comprou o carro, comprou. [European Portuguese]
 He bought the car bought

- ‘He did buy the car.’
- b. Kupit-to on kupil, no... [Russian]
 buy.INF-PART he bought but
 ‘As for buying it, he did it, but...’

As discussed in section 2.4, doubling is also present in many sign languages, including ASL, LSB, HKSL, LSQ, Croatian, Austrian, Polish and Jamaican Sign Languages (see section 2.4 for references). Some East Asian sign languages, however, have been reported to lack doubling (J. Woodward, personal communication). Functions of doubling in sign languages have also been connected to focus, contrast and emphasis, the latter function being illustrated by the LSB example in (20) (Nunes and de Quadros 2008:177). RSL and NGT therefore seem to pattern with many spoken and sign languages in this domain: they use doubling to express foregrounding, which is an IS-notion.

- (20) ANN (LIKE) ICE-CREAM LIKE [LSB]
 ‘Ann **likes** ice-cream’

Note that our analysis has an important theoretical/typological consequence. The doubling data from RSL and NGT suggest that, apart from topic and focus, an orthogonal notion of foregrounding should be used to describe IS in these two languages, and probably in other sign languages as well.

In addition, our analysis of naturalistic RSL and NGT discourse in chapter 5 lead us to suspect that doubling in sign languages is different from doubling in spoken languages, in that it is less constrained – this is particularly true for RSL and NGT, but also holds for some instances for doubling in HKSL and Jamaican Sign Language. It is less constrained in three respects: (1) RSL and NGT allow for doubling of different constituents (verbs, nouns, adjectives, wh-questions, and clauses in both sign languages; topics in NGT); (2) the function of doubling is more general than the ones described for spoken languages, and (3) doubling is used very often in naturalistic discourse. As for the last property, it is difficult to say whether sign languages are different from spoken languages with respect to frequency of doubling, as there is no information on the frequency of doubling in corpora of spoken languages. Still, based on the first and second properties, it is possible to deduce that the less constrained doubling in sign languages would be more frequent than the more constrained doubling in spoken languages. Clearly, contexts that justify affirmation or contrastive verbal focus are not as common as the contexts that justify doubling in RSL or NGT. The differences between spoken and sign languages in the domain of doubling suggest a possible modality effect. This and other modality effects are discussed in the next section.

7.4 Modality effects

One of the most important quests in the study of sign languages is the search for modality effects, that is, for features that are different in sign languages as opposed to spoken languages (GQ4) (see also section 1.2.3). Two important distinctions should be made. First, we should distinguish physiological and cognitive modality differences from modality effects on grammar. The former ones are trivial: sign languages use the hands, face and body to produce signs and the eyes to perceive them, while spoken languages use the speech apparatus (mouth, vocal cords, and lungs) to produce words and (mainly) the ears to perceive them; it is also known that on the cognitive level visual and auditory information is perceived and processed differently. The modality effects are less trivial: for instance, sign languages use space as a

Second, we must distinguish the opposition between signed and spoken languages from the opposition between the visual and auditory modalities. What complicates the latter distinction is the fact that spoken languages, if they are used in face-to-face communication (and this is the original form of language use), also exist in two modalities, as they are commonly accompanied by manual and non-manual co-speech gestures. Although there are some clear differences between sign languages and co-speech gesture, at the same time there are also many interesting parallels.

In section 7.4.1, we discuss whether manual and non-manual prosody is substantially different in signed and spoken languages. Section 7.4.2 discusses modality-specific markers of IS in RSL and NGT and their parallels to co-speech gestures. Section 7.4.3 briefly addresses the question whether doubling is modality-specific. Finally, section 7.4.4 presents a discussion on wh-clefts, a construction type that might be modality-specific as well.

If we look at the obvious differences between spoken and sign languages in the domain of IS, one of these differences is that intonation in spoken languages is expressed through modification of pitch, while in sign languages, it is either expressed by non-manual markers or by a modification of the movement and location parameters of signs. The most important question is, of course, whether the linguistic properties of intonation in spoken languages are different from sign languages – after all, a different way of expression does not necessarily imply different linguistic properties.

In fact, we do not find major differences in intonation across modalities. For non-manual markers, Pfau and Quer (2010) describe how they function on all levels of linguistic description in sign languages, from phonology to pragmatics. As for prosody, it is possible to conclude that non-manual markers fulfil functions similar to the ones intonation has in spoken languages: for instance, they mark questions, and they mark different aspects of IS, namely topics and foci. Even more strikingly, a direct parallel can be found between the tendency to mark topics by rising tone in some spoken languages (such as English, German, or Russian; see for instance Buring 1997) and by raised eyebrows in many sign languages (Sze 2011).

As for the formal properties of non-manuals in comparison to intonation, the most striking difference is that non-manuals in sign languages, in contrast to tones in spoken languages, can be layered (Nespor and Sandler 1999): for instance, mouthing may be used to mark one grammatical phenomenon, eyebrow raise another, and body tilt yet another. Hence, we could argue that in the domain of intonation, sign languages once again show more simultaneity than spoken languages. Layering of non-manuals is also observed for IS-marking; for instance, an eyebrow raise marking topics can combine with a sideward body lean marking contrast in RSL and NGT (21).

- As for the manual prosodic markers, no modality effects can be found. Stress in spoken languages is usually realized as a change in the pitch and it is used to make a word/constituent more prominent perceptually. The mechanism that sign languages employ for the same

function is completely parallel: movement (or location) of the sign is modified in order to make a sign more prominent perceptually.

7.4.2 Gesture and sign languages

In this section, we will consider in how far weak hand holds, contrastive body leans, and eyebrow raise, as markers of focus, are indeed modality-specific means of expressing IS. What is interesting about all these markers is that parallel phenomena can be found in co-speech gesture. This means that the markers are indeed modality-specific, but they are used in face-to-face communication by signers and speakers alike.

Kendon (2008) discussed the differences between signs and gestures and came to the conclusion that the distinction that is often made in the literature – signs being more “linguistic” or “verbal”, and gestures being non-linguistic or non-verbal – results from the historical development of linguistics, and is not a real empirical distinction. Structuralist, and then generative, approaches to language emphasize its discrete and systematic character, thereby excluding gesture from the linguistic domain. As for sign linguistics, one of the important objectives in the early years has been to prove that sign languages are real languages; to that end linguists engaged in applying structuralist analysis to them as well, while underscoring the differences between signs and gestures (Fischer 1974, Liddell 1980). In Kendon’s view, there is no clear boundary between signs as linguistic units, and gestures as paralinguistic ones; instead, a common ground should be found between different types of visible actions.

While not fully embracing Kendon’s proposal, in this section, we discuss the parallels between modality-specific markers of IS in RSL and NGT on the one hand and co-speech gesture on the other hand.

7.4.2.1 *Weak hand holds*

Weak hand holds, including the weak hand holds that are used to express IS-related meanings, are clearly modality-specific, as they exploit the possibility to use two partially independent articulators. It is a trivial fact that a speaker cannot “hold” a word while uttering other words at the same time. The fact that the same types of holds are present in RSL and NGT, and probably other sign languages (Vermeerbergen et al. 2007), implies that the influence of modality is more subtle than just allowing for the use of weak hand holds: it probably also specifies what types of functions the holds have, such as using holds in spatial arrangements to express background. Still, sign languages do not have to use this strategy afforded by the modality, as the case of Adamorobe Sign Language shows (Nyst 2007).

As we discussed in section 7.3.1, weak hand holds are used to express the notion of discourse topics, which might be an interesting modality effect as well, as discourse topics are not linguistically marked in spoken languages.

It is important to note that weak hand holds are not constrained to sign languages; similar phenomena are observed in co-speech gesture as well. A speaker can hold a manual gesture and at the same time express something vocally, and in fact speakers do that a lot. Vermeerbergen and Demey (2007) compared weak hand holds in Flemish Sign Language with co-speech gesture of speakers of Flemish, and found striking similarities. For instance, in Flemish Sign Language list buoys are used, whereby the non-dominant hand is held to enumerate referents, while the other hand signs information about these referents. These buoys can be built consecutively (digit by digit) or set up immediately. The same gestures

were used by speakers of Flemish when playing a game that demanded remembering long lists of items.

Flemish Sign Language also has pointer buoys – which correspond to pointing to the discourse topic in our terminology. Vermeerbergen and Demey (2007) argued that such pointing gestures are used by speakers as well. Compare the RSL example (22a), where the pointing sign referring to the discourse topic “cat” is held, to the Italian example (22b), adapted from Kendon (2004:209), where the speaker is pointing at the councilman while simultaneously producing a comment about him

- (22) a. h1: THINK MONKEY. LOOK. NICE. [RSL-cr4-10]
 h2: IX-----
 ‘She thinks it is a monkey. She looks at it. It is nice!’
 b. *Speech:* può darsi uno dei pochi assessor se – eee onesti e seri [Italian]
Gesture: pointing-----
 ‘... maybe [he is] one of the few city councilmen ser- uh honest and serious...’

Even more strikingly, we can find examples similar to weak hand holds for anchoring a referent. In the RSL example (23a), the pointing sign is held while a new referent is established in discourse. In example (23b), adapted from Kendon (2004:209) (taken from the same discourse as example (22b), preceding that example), the pointing gesture is held while the Italian speaker introduces a new referent, namely the councilman.⁸⁹

- (23) a. h1: APPEAR CANARY IX-a K-A-N-A-R-E-Y-K-A [RSL-cr1-10]
 h2: IX-b-----
 ‘There appears a canary.’
 b. *Speech:* quello è n’assessore, non ci sembra, è n’assessore [Italian]
Gesture: pointing-----
 ‘This fellow as a city councilman, it doesn’t seem so, [but] he is a city councilman...’

In chapter 6, we have seen that not only pointing signs and lists can be held, but also lexical signs, for instance, when a noun is held to refer to a discourse topic. Although Vermeerbergen and Demey (2007) did not discuss parallel examples in co-speech gesture, it is easy to imagine a speaker talking about a house and producing a descriptive gesture “house”, subsequently holding this gesture throughout the part of the discourse which is about this house. In fact, Kendon (2004:180) describes precisely this type of situation, where a gesture is held to “prolong the presentation of the idea”. In Kendon’s examples, the speaker maintains a gesture meaning “prison” across the whole piece of discourse. The function of this gesture hold seems to be the same as that of weak hand holds of nouns in sign language, namely referring to a discourse topic.

To sum up, the parallels between weak hand holds and some types of co-speech gesture are striking: both forms and functions are similar. It is a very common position that sign languages are more conventionalized than co-speech gesture (McNeill 1992). This might also be the case for weak hand holds as well: it is quite possible that their use is more systematic

⁸⁹ Kendon also noticed that when introducing (indicating) a new referent the pointing gesture has a palm down orientation, while when pointing to the already mentioned referent, as in (22b), it has a sideward palm orientation.

and constrained, and that their functions are more clear-cut than those of comparable constructions in gesture, but to date, no research has investigated this issue (see section 7.5.3).

7.4.2.2 Contrastive use of space

Another modality-specific feature of IS-marking in RSL and NGT are sideward body leans and dominance reversals. It is clear that such use of space for contrast is only available in the visual modality. We even argued that it might be problematic to use this marker as an argument in the debate about the relation between contrast and focus, as it is so clearly modality-specific.

(24) a. [Russian]



Speech: ili moi p'atero,
or my five

ili u vas odin
or at you one

Gesture: rightward lean-----
'... my five (children), or your one...'

leftward lean-----

(Anna Vihlayeva, documentary "Pisma iz provintsii", TV-channel "Kultura".)

b. [Russian]



Speech: ili est nauka,
or is science

ili net nauki
or no science

Gesture: hands to left-----
'...either there is science, or there is no science.'

hands to right---

(Aleksandr Alimov, from TV-show "Gordon", TV-Channel NTV)

But as before, it is equally clear that sideward body leans and, more generally, contrastive localizations are used in co-speech gesture to express contrast as well. Consider examples (24a) and (24b) from the Russian National Corpus (www.ruscorpora.ru/en/). In (24a) the contrast between "my five" and "your one" is emphasized by sideward body (and head) leans. In (24b) the speaker conducts a gesture with his both hands, first placing it to the left, and

If doubling is indeed more common to sign languages than to spoken languages, then the pattern might comply with the generalization that iconicity plays a greater role in the visual modality. After all, doubling (and repetition/reduplication in general) is an iconic grammatical mechanism. In the case of doubling in RSL and NGT, the iconic relation is straightforward: the constituent that appears in the sentence twice expresses the more important part of information. However, note that this type of iconicity is perfectly accessible to spoken languages as well: for instance, when verbal doubling is used in Brazilian Portuguese to mark polarity (and therefore to emphasize the verb), it is as iconic as doubling in RSL or NGT; reduplication has been claimed to be iconic in spoken languages, too. Hence, one would not expect doubling to be more common to sign languages than to spoken languages based on iconicity alone. It might be the case that sign languages in general prefer iconic grammatical structures more than spoken languages, but this claim is difficult to test.

In section 5.5.3, we offered two theories that could explain the prominence of doubling in sign languages. One of the theories is connected to the socio-linguistic properties of sign languages, while the other refers to cognitive abilities and is indeed modality-specific.

As for the first theory, it is related to the fact that most of the signers are non-native, as they are not born into signing families and therefore do not have access to sign language until later in life. Moreover, signers constantly interact with hearing non-native signers: family members, teachers, interpreters etc. Doubling of the important information might be a convenient strategy to compensate for the imperfect information transfer. However, this theory would also predict doubling to be especially common in pidgin and creole languages (see Fischer 1978 on parallels between sign languages and creoles). At least for creoles, this does not seem to be the case, although more research is necessary to test this prediction.

As for the modality-specific theory, doubling may be connected to short-term memory limitations. Psycholinguistic research has shown that short-term memory for signs is more limited than short-term memory for words (Geraci et al. 2008). This might be connected to the fact that auditory information is much more linear than visual information. Doubling would then again be a compensatory strategy, as the most important information appears in the sentence in two different positions, thus lowering the burden on the short-term memory. One problem for this account is that short-term memory limitations are only reported for serial recall tasks, while it has not been shown that there are any limitations during the processing of natural sentences, and much more research is needed in this field.

Finally, it is important to note that both the socio-linguistic and the cognitive theory are supposed to explain prominence of doubling cross-linguistically and to offer hypotheses on why doubling has appeared in sign languages, including RSL and NGT. These theories are not supposed to explain individual cases of doubling in these languages, since in our analysis, doubling is used synchronically for pragmatic and grammatical reasons.

7.4.4 Wh-clefts

The last issue that might be connected to modality in the domain of IS is the case of the so-called wh-clefts. Since we have not looked at wh-clefts in much detail, we first briefly introduce the issue and then show that RSL and NGT data can play a role in the debate as well.

As we have discussed in chapter 2, wh-clefts are present in many sign languages. When these constructions were first described, they were referred to as rhetorical questions (Baker-Shenk 1983). Later Wilbur (1996) argued that ASL constructions like (26a) should rather be analysed as wh-clefts, where the first clause expresses the topic and the second clause the focus of the sentence (Wilbur 1996:210), similar to what happens in many spoken

(26) a. IX-1 DISLIKE WHAT / LEE POSS TIE
‘What I dislike is Lee’s tie.’ [ASL]

b. JOHN HAVE MOTORCYCLE / NO (HE NOT HAVE MOTORCYCLE)
‘John doesn’t have a motorcycle.’ [ASL]

As for the first (question) part, they argued that it is an embedded interrogative and not a relative clause, as Wilbur argued, as ASL relative clauses never contain *wh*-words. In addition, they showed that the question part can also be a polar question and provided evidence that the second part is a partially elided declarative clause. Example (26b), for instance, is analysed as including a polar question in the first part and the obligatory negative reply NO in the second part; optionally the second part may include the omitted material (HE NOT HAVE MOTORCYCLE) (Caponigro and Davidson 2011:336). In spoken languages, polar question cannot form a part of *wh*-clefts (*Does John have a motorcycle no), and moreover, the second clause in *wh*-clefts cannot be a full sentence (*What John likes is he likes ice-cream).

In RSL and NGT, we can find examples parallel to the ones Caponigro and Davidson (2011) used to argue against Wilbur's analysis. For instance, in (27a) the second clause OBVIOUS BIRD SELF DRIVE is a full-sentence answer to the question, which is unexpected in wh-clefts. Even more strikingly, there are some examples in which the addressee misinterprets the first part of the construction as a real question, as in (27b). The signer (S) signs the first part of the construction IN TRAM WHO, which is misinterpreted by the addressee (A) as a wh-question and thus answered with the sign BIRD, before S completes the construction, which indicates that actually no question was implied. It is unlikely that such a misinterpretation of the first part of a cleft as a real question would happen in English, because the first part of a wh-cleft and a real question are structurally different, which is apparently not the case for NGT.

- (27) a. er+bht / OBVIOUS BIRD SELF DRIVE [NGT-27-3]
 ‘The bird herself drives it [the tram].’
 b. S: IN TRAM / WHO / BIRD AND GRANNY OLD GRANNY / DRIVE
 A: BIRD [NGT-2081-84]
 ‘Who is in the tram? The bird and the granny drive it.’

Further research is needed to carefully describe the properties of these constructions in RSL and NGT. However, it is already clear that they have some properties that distinguish them from wh-clefts in spoken languages. The question remains whether these constructions are modality-specific and why. One hypothesis that requires testing is that these constructions

indeed are rhetorical question, parallel to the ones present in spoken languages, as Baker-Shenk (1983) originally suggested. With extensive corpus data available for NGT and some other sign languages, it is now possible to test whether the restrictions that Wilbur (1996) and Caponigro and Davidson (2011) used to argue against this analysis actually hold for these languages.

7.5 Future research directions

Possible future directions for research have emerged in the previous chapters. One obvious direction is to study IS in other sign languages, including non-Western urban and village sign languages, using a methodology comparable to the one used in the current study. Interesting typological generalizations in this domain are bound to follow from such research.

In the remainder of the section, we first address directions concerning methodology and the new approaches that can be used to analyse IS in sign languages, including RSL and NGT (section 7.5.1). We then turn to possible future studies on IS-issues related to the ones studied in this dissertation, such as *wh*-clefts (section 7.5.2). Finally, the third direction is connected to the interrelation between sign languages and co-speech gesture in the domain of IS (section 7.5.3).

7.5.1 Methodological issues

In this dissertation, we studied markers of topics and foci in RSL and NGT and subjected the two sign languages to a comparison with respect to these markers. The field of IS-marking presents us with a number of methodological challenges, and in addition, there are methodological challenges that are connected to the comparison of sign languages.

In particular, for the studies of topics, we used corpus data. Although the data was partially based on the same stimuli (Canary Row stories), we still have not specifically collected fully parallel examples in the two languages. One possible continuation of our study would therefore be a research project in the vein of Dachkovsky et al. (2013). The elicitation of a similar set of sentences from both languages would allow for a detailed comparison between the form and functions of non-manual markers, as Dachkovsky et al. (2013) did for ASL and ISL. Since in this project, we have established the basic strategies of topic marking in RSL and NGT, it would be possible to create a questionnaire based on the accumulated knowledge we have now; in addition, the elicited sentences can be compared to the more naturalistic data collected in this project.

Another methodological issue concerns the annotation, especially the annotation of manual prosodic markers and non-manuals. In the study of topics, we used naturalistic corpus data, and with such data, it is notoriously difficult to reach a high reliability of transcription due to multiple context factors that can influence the markers. Even for the data elicited for the study of focus, annotation is far from trivial (see section 4.2). One possible solution for this problem would be automatic annotation of both manual prosodic parameters and non-manual markers. As discussed in Karppa et al. (2012), a software is currently being developed that will allow automatic annotation of 2D video-files according to such parameters as speed of movement, mouth actions, head position, eyebrow movement etc. The results are very promising: Karppa et al. (2012) reported that the accuracy of this method is comparable to the accuracy of motion capture systems. Once this software is available, it can be applied to the already existing RSL and NGT data in order to perform a more reliable quantificational analysis.

Finally, due to the difficulties of annotation discussed above, in this study, we ignored one of the important non-manual markers, namely eye aperture. As described for NGT focus marking in Crasborn and van der Kooij (2013), eye aperture is a marker related to eyebrow raise and backward head tilt: they often co-occur, and they fulfil the same function. Impressionistically, eye aperture is indeed used to mark focus in our NGT data as well. As for topics, it might be the case that eye aperture does not mark topics *per se*, but instead is correlated with the activation status of the information, as reported for ASL and ISL in Dachkovsky and Sandler (2009). Hopefully, in the future, automatic annotation of eye aperture will be available as well, and this technique can then be fruitfully applied in another follow-up study on IS in RSL and NGT.

7.5.2 Related topics

There are several aspects of IS in RSL and NGT that we mentioned in passing, but did not pursue in detail due to the lack of time. All of these aspects would make for interesting topics of study in follow-up projects.

One such aspect is the so-called *wh*-cleft, as discussed in section 7.4.4. We have seen that such a construction exists in RSL and NGT. Moreover, it presents us with an interesting test ground to observe possible modality effects. Currently corpus data is available for many sign languages, including RSL and NGT, and this construction can be easily found in the corpora. It would be thus very promising to see whether the properties of this construction allows classifying them as *wh*-clefts (Wilbur 1996), modality-specific question-answer pairs (Caponigro and Davidson 2011), or rhetorical questions (Baker-Shenk 1983).

Focus in RSL and NGT in general deserves further analysis. In this dissertation, we only analysed focus in simple clauses, and only for three types of focus. It would certainly be interesting to investigate how focus is realized in more complex contexts, such as subordinate clauses. In addition, it is important to study semantic and pragmatic effects of focus, such as the interaction of focus and quantifiers (Krifka to appear), and focus-sensitive operators (discussed for NGT in Herrmann 2013, but not described for RSL at all). The question whether contrast should be considered a notion separate from focus, which we tackled in section 7.3.2.2, should be studied in more detail as well; for instance, it would be interesting to see how contrast is realized if more than two alternatives are present.

Another phenomenon that we mentioned but did not discuss in detail is dominance reversal. It is clear that dominance reversal is used to express contrast in RSL and NGT, as in other sign languages (Frishberg 1985); however, it is very likely to be used for other purposes as well. A cross-linguistic comparison of dominance reversal is therefore a potentially interesting field.

7.5.3 Gesture vs. sign

Finally, a comparison of sign languages and co-speech gesture in the domain of IS is also a very promising domain for future research. On the one hand, such a study may help determine the boundary between signs and gesture (Kendon 2006), and on the other hand, it can clarify the (gestural) origin of many markers of IS in sign languages (Pfau and Steinbach 2011).

We have seen that many parallels can be found between the markers of topics and foci in RSL and NGT on the one hand, and co-speech gestures used in the hearing communities on the other hand. For instance, eyebrow raise is used to mark focus in NGT, and it is probably also used by members of the hearing community to emphasize important information, at least in the USA (Ekman 1979). It would therefore be interesting to scrutinize whether this marker

is used by speakers in the Netherlands and in Russia as well. One hypothesis would be that it is used in Russia less than in the Netherlands, which would explain why it has not been grammaticalized as a marker of focus in RSL. In addition, head nods are used in similar contexts by signers and speakers. Again, an empirical study of similarities and differences between signers and speakers would be interesting.

Another domain of possible comparison concerns sideward body leans, which, as we have seen, are not only used to express contrast in RSL and NGT, but also in co-speech gesture. In the future, it would be desirable to conduct a comparison between the sign languages and the gesture used in the same communities in order to find out whether sign languages indeed use this marker in a more systematic way. A similar comparison should be made between weak hand holds in RSL and NGT on the one hand, and gestural holds as used in the hearing communities on the other hand.

Clearly, such comparisons between sign languages and co-speech gesture could profit from some of the data collected for and/or analyzed in the present study. For instance, video recordings of Russian and Dutch speakers retelling the Canary Row stories would allow for a direct comparison between the markers described in this study and the non-manual and manual behaviour of speakers. We might find that sign languages indeed use the markers in a more systematic way, thereby confirming the grammaticalization path from gesture to grammatical markers proposed by Pfau and Steinbach (2011), or it might turn out that the use of co-speech gesture is equally systematic, providing an argument for the analysis of gesture as an integral part of the language (Kendon 2006).

Appendix A1. Stimuli

Tables A1.1-3 below contain all the stimuli used in this research project. Table A1.1 contains test items which have been used to analyze signs in focus. Table A1.2 provides test items where only the question parts have been used in order to obtain the non-focused versions of signs.

In the first table several shortcuts are used. Sc stands for scope. Th means sentence-focus (thetic). FT stands for focus type. IF – information focus; Sel – selective focus; Corr – corrective focus. Table A1.3 classifies all signs according to movement types. HI – hand-internal; P – path, SP – small path.

In addition to the tables, QUIS elicitation materials are provided below. In the test setup they were numbered 25-28, therefore, these items are missing from the first table.

Table A1.1. Test items for which answers are analyzed (see section 4.2).

#	Sc	FT	Sign	Sentence	Question	Language
1	S	IF	Girl	The girl is hitting the boy.	Who is hitting the boy?	RSL, NGT
2	S	IF	Dog	The dog is biting the man.	Who is biting the man?	RSL, NGT
3	O	IF	Dog	The man is holding the dog.	What is the man holding?	RSL, NGT
4	O	IF	Woman	The man is seeing the woman.	Who is the man seeing?	RSL, NGT
5	VP	IF	Cook Soup	The woman is cooking soup.	What is the woman doing?	RSL, NGT
6a	VP	IF	Carry Girl	The man is carrying a girl.	What is the man doing?	RSL
6b	VP	IF	Carry Boy	The man is carrying a boy.	What is the man doing?	NGT
7	Th	IF	Dog Bark	The dog is barking.	What is happening?	RSL, NGT
8	Th	IF	House Burn	The house is on fire.	What is happening?	RSL, NGT
9	S	Sel	Woman	The woman is building the house.	Who is building the house: the man or the woman?	RSL, NGT
10	S	Sel	Boy	The boy is walking.	Who is walking: a boy or a girl?	RSL, NGT
11	O	Sel	Father	The girl is kissing her father.	Who is the girl kissing: her father or her mother?	RSL, NGT
12a	O	Sel	Dog	The girl is caressing the dog.	Who does the girl caress: the dog or the cat?	RSL
12b	O	Sel	Canary	The girl is playing with a canary.	Who is the girl playing with: the dog or the canary?	NGT

13	VP	Sel	Kiss Boy	The girl is kissing the boy.	What is the girl doing: kissing the boy or throwing a stone?	RSL, NGT
14a	VP	Sel	Play Guitar	The boy is playing guitar.	What is the boy doing: playing the guitar or cutting the tree?	RSL
14b	VP	Sel	Play Violin	The boy is playing violin.	What is the boy doing: playing the violin or cutting the tree?	NGT
15	Th	Sel	People Celebrate	People are celebrating on the street.	What is happening: a man jumps or are people celebrating?	RSL, NGT
16	Th	Sel	Man Fall	A man fell.	What happened: A man fell or a bomb exploded?	RSL, NGT
17	S	Corr	Dog	The dog is sleeping.	The cat is sleeping, right?	RSL, NGT
18	S	Corr	Man	The man is taking pictures of a girl.	The woman is taking pictures of a girl, right?	RSL, NGT
19	O	Corr	Ice-cream	The woman is eating ice-cream.	The woman is eating chocolate, right?	RSL, NGT
20	O	Corr	Woman	No, the man is combing the woman.	The man is combing the boy, right?	RSL, NGT
21	VP	Corr	Fix Bike	The boy is fixing a bike.	The boy is cooking the soup, right?	RSL, NGT
22a	VP	Corr	Push Girl	The man is pushing the girl.	The man is fixing the bike, right?	RSL
22b	VP	Corr	Push Boy	The man is pushing the boy.	The man is fixing the bike, right?	NGT
23	Th	Corr	Car Tree Crash	No, a car crashed into tree.	A woman is riding a bike, right?	RSL, NGT
24	Th	Corr	Bomb Explode	The bomb has exploded.	There is an earthquake, right?	RSL, NGT
29a	S	Sel	Tree	The tree fell.	What fell: the tree or the light pole?	RSL
29b	O	IF	Boy	The girl is whispering to the boy.	Who is the girl whispering to?	NGT
30a	O	Corr	Candy	No, he is eating candy.	The boy is eating ice-cream, right?	RSL
30b	S	IF	Boy	The boy is eating the candy.	Who is eating the candy?	NGT
31a	S	IF	Horse	A horse is drinking.	Who is drinking?	RSL
31b	O	Corr	Man	No, the dog is biting the man.	The dog is biting the woman, right?	NGT
32a	S	Corr	Cat	No, the cat is eating.	The dog is eating, right?	RSL

32b	S	Sel	Cat	The cat is eating.	Who is eating: the cat or the dog?	NGT
33a	VP	Corr	Tree	No, the man is cutting a tree.	The man is painting a wall, right?	RSL
33b	S	IF	Woman	A woman.	Who fell?	NGT
34	V	IF	Cook	The woman is cooking it.	What is the woman doing with the soup?	RSL, NGT
35	V	IF	Throw	He is throwing it.	What is the boy doing with the ball?	RSL, NGT
36	V	Sel	Take picture	She is photographing them.	What is the girl doing with flowers: taking a picture or painting him?	RSL, NGT
37	V	Sel	Jump	She is jumping.	What is the woman doing: running or jumping?	RSL, NGT
38	V	Corr	Close eyes	No, he is closing the eyes.	The man is opening the eyes, correct?	RSL, NGT
39	V	Corr	Ride a bike	No, she is riding it.	The woman is holding the bike, correct?	RSL, NGT

Table A1.2. Test items for which only questions have been used.

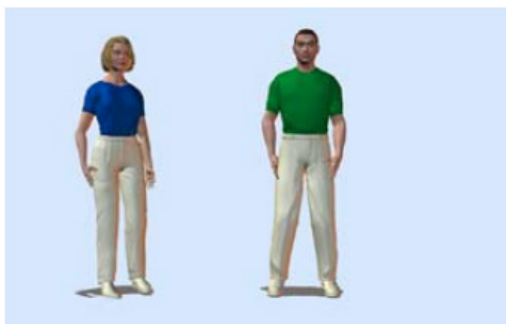
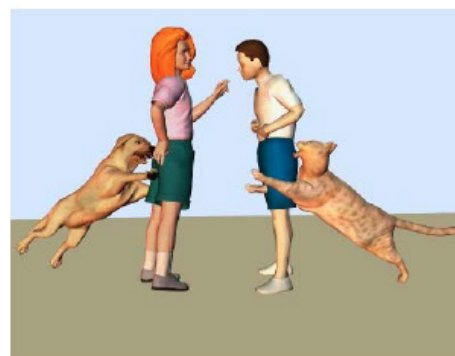
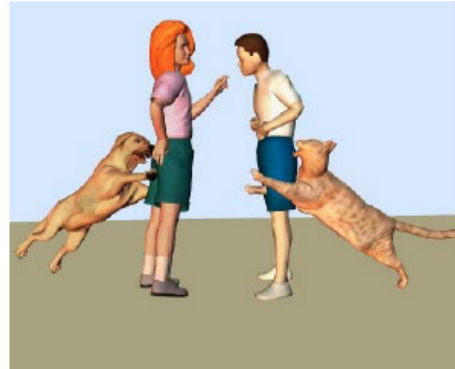
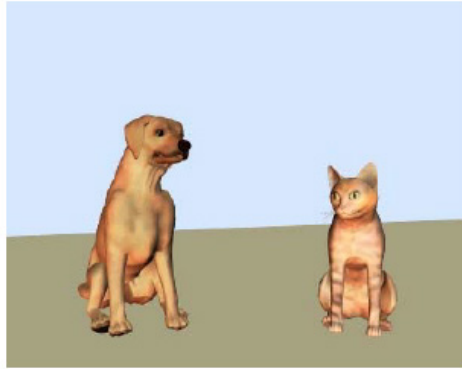
#	Sign not in focus	Question	Language
40	FATHER PUSH	What does the <i>father</i> push?	RSL, NGT
41	CAR	Who buys the <i>car</i> : a man or a woman?	RSL, NGT
42	BOMB	Who carries the <i>bomb</i> ?	RSL, NGT
43a	PLAY VIOLIN	Who <i>plays violin</i> – a girl or a boy?	RSL
43b	PLAY GUITAR	Who <i>plays guitar</i> – a girl or a boy?	NGT
44a	CUT	Who <i>cuts</i> the tree – a man or a woman?	RSL
44b	CANARY	Who carries the <i>canary</i> : a cat or a dog?	NGT
45	THROW	Who <i>throws</i> the ball?	RSL, NGT
46	CLOSE EYES	Who <i>closes eyes</i> ?	RSL, NGT
47	RIDE BIKE	Who <i>rides a bicycle</i>	RSL, NGT
48	FIX	Who <i>fixes</i> the car	RSL, NGT
49	ICE-CREAM	Who eats <i>ice-cream</i> ?	NGT

Table A1.3. Signs in RSL and NGT: movement types.

Sign	Movement type	Movement type
	RSL	NGT
BIKE	P	P
BOMB	P	P
BOY	SP	HI
CANARY		HI
CANDY	HI	
CAR	P	P
CARRY	P	P
CAT	P	P
CHILD		P
CLOSE.EYES	HI	HI
DOG	HI	SP
FALL	P	P
FATHER	P	SP
FIX	P	HI
GIRL	SP	P
GUITAR	HI	
HORSE	SP	
HOUSE	P	P
ICE-CREAM	P	P
JUMP		P
KISS	P	P
MAN	SP	HI
PHOTOGRAPH	HI	HI
PUSH	P	P
SAW	P	
SIT.ON	P	
SOUP	HI	P
THROW	P	P
TREE	HI ⁹⁰	HI
VIOLIN		P
WOMAN	SP	HI

Questionnaire on Information Structure (QUIS, Skopeteas et al. 2006) is a reference manual for collecting data on IS during fieldwork. It contains different stimuli (in picture and video form) that can be used to study various categories of IS. One of the categories in this manual is contrast (pp. 107-111). Pairs of pictures with contrasted referents are provided, such that the first picture introduces two referents and on the second picture these two referents interact with two other referents. It is expected that the referents introduced in the first picture will become contrastive topics, and the new referent will be contrastive foci. The pairs of pictures used in the current research project are provided on figure A1.1.

⁹⁰ Movement of the sign TREE in both languages has also been classified as hand-internal, although it involves more proximal joints, because the movement in this sign involves a rotation of the fore-arm which cannot be made larger in trajectory.



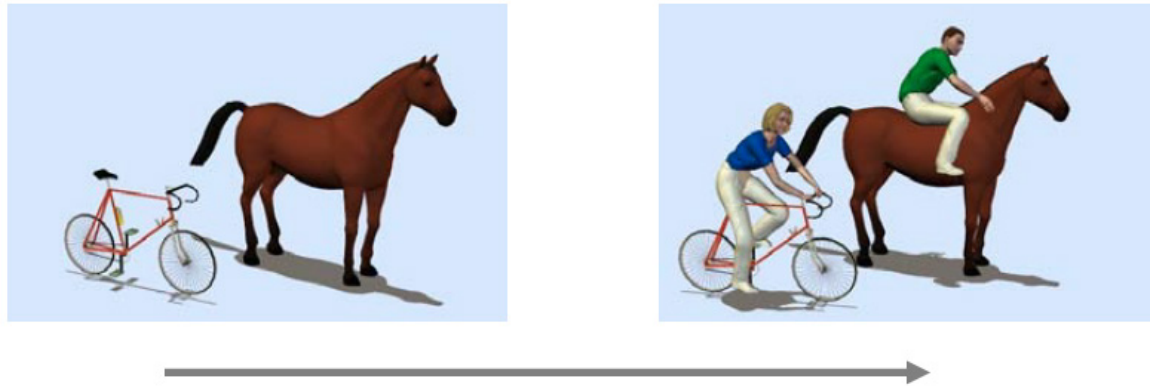


Figure A1.1. Pictures from QUIS used to elicit contrast. In the first pair of pictures the dog and the cat are expected to be contrasted topics, and the boy and the girl – contrastive foci. In the second pair the opposite relation is expected. In the third pair the man and the woman are expected to be contrastive topics, and the bike and the horse – contrastive foci. In the fourth pair the opposite relation is expected.

Appendix A2. Testing reliability of coding for manual prosodic markers

Since the annotation of possible manual prosodic markers in RSL and NGT is based on observation, reliability of this procedure needs to be tested. In order to do that, a small additional experiment has been conducted. Ten people compared 40 pairs of signs according to one of the five parameters: length, size of the movement, speed of the movement, number of repetitions, and location.

The 40 pairs of signs were selected from the original experiment. 20 pairs were selected from the RSL data and 20 from the NGT data. For each parameter, four pairs were selected: one pair with the first sign longer (larger/faster/higher/contained more repetitions), one pair with the second sign longer (larger/faster/higher/contained more repetitions), and two pairs with no perceptible difference between the signs according to the relevant parameter. The selection of signs was random: a random order has been generated and the pairs were selected to fulfil one of the conditions described above in this random order. If possible, videos were used in two different conditions: for instance, once to represent the same number of repetitions, and once to represent a different speed of movement. In RSL, seven of the ten signers ended up in this test; in NGT – five of the ten signers.

Signs of each pair were cut in a video editor in order to be fully taken out of the context. The main purpose was to get rid of the transitional movement. The first frame in the resulting video was the frame when the location and the handshape were fully formed, while the last frame was the frame after which the location and/or handshape were changed. As we discuss below, it was not always possible to fully get rid of effects of the context. The two signs in each pair were combined in one video, and a black screen with the text “first sign” or “second sign” with the duration of one second were added before the corresponding signs in pairs. Most of the signs were presented in half speed, although several very short signs were presented in $\frac{1}{4}$ of real speed to make comparison possible. The participants were able to replay the video as many times as necessary.

An on-line survey was created (on the web-site <http://www.thesistools.com/>, the videos were placed on-line on www.youtube.com). The participants were supposed to watch each of the 40 videos and answer one question per video. All the questions were formulated in the following way: “Which sign is longer (larger/faster/higher/contains more repetitions)?” and the three options for an answer were “First / Second / No difference”. Sometimes additional

information was provided due to some linguistically relevant complications. For instance, in two of the pairs in one of the signs the weak (left) hand was participating in a hold thereby representing a different sign; to avoid confusion the instruction “ignore the left hand” was provided. The pairs were presented in a fully randomized order, the same for all participants. The full randomization resulted in the fact that sometimes questions of the same types followed each other immediately.

Ten Russian and Dutch speakers (25-40 years old) with no knowledge of either RSL or NGT participated in the experiment. Since the purpose of the experiment was to test the reliability of my judgments with respect to such parameters as length of the sign or number of repetitions, the knowledge of a sign language was not required. Moreover, people with background in sign language research might have been influenced by their knowledge of phonological and phonetic processes and therefore biased. However, as we show below, this decision also has its drawbacks.

The results of this test have been analyzed to assess reliability of my measurements based on agreement between me and the other raters. There are many statistics available to assess agreement (Uebersax 2014). In this case we report the following statistics: overall agreement between the participants and pair-wise agreement (assessed with Cohen’s kappa, (Cohen 1960)) between each participant’s and the author’s judgments.

Overall raw agreement between the participants is 0.645. This roughly means that in 64% of the cases the participants agree with each other; however, this statistics does not take into account chance agreement (this is discussed in the next paragraph). Importantly, one can assess raw agreement within different answer categories. In this case categories are possible answers: “first sign”, “second sign”, “no difference”. It turns out that the last category (no difference) has the lowest raw agreement (0.59), which means that participants disagree with each other more in the pairs which according to my judgments contain no difference between the signs. The importance of this fact is discussed below. This measurement is also not very useful because it only shows agreement between participants but not the agreement of participants with my judgments.

Table A2.1. Agreement assessment (Cohen’s kappa).

#	Unweighted kappa	Weighted kappa-1	Weighted kappa-2
1	0.68	0.7	0.73
2	0.61	0.63	0.67
3	0.64	0.75	1
4	0.57	0.61	0.66
5	0.49	0.53	0.6
6	0.43	0.5	0.63
7	0.65	0.71	0.8
8	0.74	0.8	0.93
9	0.57	0.58	0.61
10	0.49	0.58	0.77
Mean	0.587	0.639	0.74

The pair-wise agreement of participants with my judgments is provided in table A2.1. The table contains the results of applying Cohen’s kappa to the data. This test takes into account chance agreement; therefore, it is stricter. In the first column, unweighted Cohen’s kappa is provided, that is, every mistake is considered equally bad. The mean agreement is 0.587 (where 1 represents full agreement and 0 – lack of agreement), ranging from 0.43 to 0.74.

This agreement is quite low; however, we argue that weighted agreement is a more appropriate measure here.

As discussed in section 4.2.4.3, during transcription and annotation the following methodological decision has been taken: if the difference between the signs according to some parameter is too small, we annotate it as “no difference”. This can lead to underestimation of prosodic effects, but this is a less serious mistake than overestimation of effects. However, the participants of the reliability experiment were not instructed to follow this strategy. Therefore, in many cases they annotated very subtle differences that we consciously ignored in the analysis.

This also means that some of the disagreement between my judgments and the judgments of the participants should be considered “less serious”. There are three types of mistakes: 1) I analyze one sign in the pair as larger/longer/..., while the participant analyzes the other sign in the pair as larger/longer/...; 2) I analyze one of the signs as larger/longer/..., while the participant does not see any difference; and 3) I analyze the pair as containing no difference, while the participant finds a difference. The first two types of mistakes are serious: they undermine the reliability of my analysis; the third type is less serious and based on my methodological decisions. Recall also that overall agreement is the lowest exactly for the answer “no difference”.

To take this into account, I used weighted Cohen’s kappa measurement which allows giving different weights to different types of mistakes. In the first pattern correct answers receive a weight coefficient of 0, mistakes of types 1) and 2) receive a weight coefficient of 2, and mistakes of type 3) the weight coefficient of 1. In the second pattern correct answers receive a weight coefficient of 0, mistakes of types 1) and 2) receive a weight coefficient of 2, and mistakes of type 3) the weight coefficient of 0 (which basically means that mistakes of this type are not considered mistakes at all). These patterns are also summarized in table A2.2.

Table A2.2. Coefficients for weighted kappas.

Mistake	Unweighted kappa	Weighted kappa-1	Weighted kappa-2
Correct	0	0	0
Type 1	1	2	2
Type 2	1	2	2
Type 3	1	1	0

Table A2.1 reports the result of applying the two different weighting patterns. The table shows that with the first approach the mean agreement is 0.693 (ranging from 0.5 to 0.8), while with the second approach the mean agreement is 0.74 (ranging from 0.6 to 1).

There are no definitive ways of interpreting these agreement numbers. Different researchers offer different assessments of the strength of agreement. For instance, according to Landis and Koch (1997), both 0.693 and 0.74 fall within the category of substantial agreement, according to Altman (1991), they both are assessed as good agreement, and according to Fleiss, Levin and Paik (2003), as fair to good agreement (and the category of good agreement starts at 0.75). In any scenario, it is clear that agreement is not perfect, which can undermine the analysis discussed in this chapter. However, if we look in detail at the cases that cause the most disagreement, it turns out that most of them can be explained by the presence of linguistically relevant complications or by the tendency of raters to see the most subtle differences.

In total, there are eight cases where four or more of the participants (that is, more than one third) disagree with my judgments. In six of the eight cases my judgment is “no difference”, while the participants see a difference. As discussed above, this type of mistake is a result of a

deliberate decision on my part. In addition, in some of these cases additional complications are present. For instance, in one of the cases the movement of the sign has slightly different directions, which makes it difficult to compare its length. In two of the cases the movement is very short, and small parts of the transitional movements can be seen in the videos.

In one of the remaining two pairs the number of repetitions is assessed. One of the signs contains two movements, while the other one only contains one; however, the movement is very small. When I discussed this difference with some of the participants after the experiment, they acknowledged its presence, although they did not see it during the testing. Finally, in the last pair that caused a lot of disagreement, I assessed the speed of movement as different for the two signs, while most of the participants saw no difference. This is the only case where I can acknowledge a mistaken judgment on my part. Note that in the other 32 cases at least two thirds of the participants agree with my judgments.

To sum up, agreement testing shows that if non-signers are asked to assess signs with respect to length, size and speed of movement, number of repetitions, and location of signs taken out of the context, they do not show a very high degree of agreement. However, if we take into account my original decision to deliberately underestimate differences, the agreement of participants with my judgments becomes higher. Moreover, some linguistic factors influencing the naïve participants' decisions cannot be avoided if the data for reliability testing is taken from sentences and not specifically elicited isolated signs. Therefore, I argue that the results of this reliability test demonstrate that although my procedure of annotation is not fully objective, it can be used for the purposes of descriptive research as presented further in this chapter.

In future studies it is advisable that more objective measures are used. A group of researchers is now working on an application that allows for automatic annotation of movement in video files of sign language (Karppa et al. 2012). Such an application will allow assessing, for instance, speed and size of movement, or location height more objectively. Note however that this task is not trivial, and linguistically relevant complications may still arise. For instance, objective location height will be affected by body position, but the linguistically relevant difference in location should be assessed not with respect to the floor (or the lower boundary of the frame), but with respect to the body of the signer, which might be more difficult to do automatically.

References

- Aarons, D. (1994). *Aspects of Syntax of American Sign Language*. (Unpublished doctoral Dissertation). Boston University, Boston.
- Aboh, E.O. (2010). Information structuring begins with the numeration. *Iberia*, 2(1), 12–42.
- Aboh, E.O., & Essegbey, J. (Eds.). (2010). *Topics in Kwa Syntax*. Studies in Natural Language and Linguistic Theory 78. Dordrecht: Springer.
- Aikhenvald, A.Y. (2006). Serial verb constructions in typological perspective. In A.Y. Aikhenvald & R.M.W. Dixon (Eds.), *Serial Verb Constructions* (pp. 1–68). Oxford: Oxford University Press.
- Altman, D.G. (1991). *Practical Statistics for Medical Research* (Vol. 12). CRC Press.
- Ariel, M. (1990). *Accessing Noun-phrase Antecedents*. London: Routledge, Croom Helm.
- Arregi, K. (to appear). Focus projection theories. In C. Fery & S. Ishihara (Eds.), *The Oxford Handbook on Information Structure*. Oxford: Oxford University Press.
- Baker, A.E., van den Bogaerde, B., Pfau, R., & Schermer, T. (Eds.) (2008). *Gebarentaalwetenschap: een Inleiding*. Deventer: Van Tricht
- Baker-Shenk, C.L. (1983). *A Microanalysis of the Nonmanual Components of Questions in American Sign Language* (Unpublished doctoral dissertation). University of California, Berkeley.
- Barberà, G. (2012). *The Meaning of Space in Catalan Sign Language (LSC). Reference, Specificity and Structure in Signed Discourse* (Unpublished doctoral dissertation). Universitat Pompeu Fabra, Barcelona.
- Battison, R. (1978). *Lexical Borrowing in American Sign Language*. Silver Spring, MD: Linstok Press.
- Bellugi, U., & Klima, E.S. (1979). Language: perspectives from another modality. *Brain and Mind*, 69, 99–117.
- Benedicto, E., Cvejanov, S., & Quer, J. (2008). The morphosyntax of verbs of motion in serial constructions: a crosslinguistic study in three signed languages. In J. Quer (Ed.), *Signs of the Time: Selected Papers from TISLR 8* (pp. 111–132). Hamburg: Signum.
- Bickford, J.A. (2005). *The Signed Languages of Eastern Europe*. SIL International.
- Borodulina, D.A. (2012). Sredstva vyrazhenija imperativa v russkom zhestovom jazyke. (Expression of imperative in Russian Sign Language). In O.V. Fedorova (Ed.), *Russkij Zhestovyj Jazyk: Pervaja Lingvisticheskaja Konferentsija* (Russian Sign Language: The first linguistic conference) (pp. 14–49). Moscow.
- Bos, H. (1995). Pronoun copy in sign language of the Netherlands. In H. Bos & T. Schermer (Eds.), *Sign Language Research 1994: Proceedings of the Fourth European Congress on Sign Language Research* (pp. 121–147). Hamburg: Signum.
- Boutla, M., Supalla, T., Newport, E.L., & Bavelier, D. (2004). Short-term memory span: insights from sign language. *Nature Neuroscience*, 7(9), 997–1002.
- Branchini, C., & Donati, C. (2009). Relatively different: Italian Sign Language relative clauses in a typological perspective. In A. Liptak (Ed.), *Correlatives Crosslinguistically* (pp. 157–191). Amsterdam: John Benjamins.
- Brentari, D. (1998). *A Prosodic Model of Sign Language Phonology*. MIT Press.
- Brentari, D., & Crossley, L. (2002). Prosody on the hands and face. Evidence from American Sign Language. *Sign Language & Linguistics*, 5(2), 105–130.
- Brunetti, L. (2009). On links and tails in Italian. *Lingua*, 119(5), 756–781.
- Büring, D. (1997). *The Meaning of Topic and Focus — The 59th Street Bridge Accent*. London: Routledge.

- Büring, D. (2010). Towards a typology of focus realization. In M. Zimmermann & C. Féry (Eds.), *Information Structure* (pp. 177–205). New York, NY: Oxford University Press.
- Burkova, S.I. (2012). Uslovnye konstruktsii v russkom zhestovom jazyke. (Conditional constructions in Russian Sign Language). In O.V. Fedorova (Ed.), *Russkij Zhestovyy Jazyk: Pervaja Lingvisticheskaja Konferentsija* (Russian Sign Language: The first linguistic conference) (pp. 50–81). Moscow.
- Burkova, S.I., & Varinova, O.A. (2012). K voprosu os territorialnom i sotsialnom var'irovanii russkogo zhestovogo jazyka (On the problem of regional and social variation in Russian Sign Language). In O.V. Fedorova (Ed.), *Russkij Zhestovyy Jazyk: Pervaja Lingvisticheskaja Konferentsija* (Russian Sign Language: The first linguistic conference) (pp. 127–143). Moscow.
- Caponigro, I., & Davidson, K. (2011). Ask, and tell as well: clausal question-answer pairs in ASL. *Natural Language Semantics*, 19(4), 323–371.
- Cecchetto, C., Geraci, C., & Zucchi, S. (2009). Another way to mark syntactic dependencies. The case for right peripheral specifiers in sign languages. *Language*, 85(2), 278–320.
- Chafe, W.L. (1976). Givenness, contrastiveness, definiteness, subjects, topics, and point of view. In C.N. Li (Ed.), *Subject and topic* (pp. 25–55). New York: Academic Press.
- Chafe, W.L. (Ed.) (1980). *The Pear Stories. Cognitive, Cultural, and Linguistic Aspects of Narrative Production*. Norwood, NJ: Ablex.
- Chafe, W.L. (1994). *Discourse, Consciousness, and Time. The Flow and Displacement of Conscious Experience in Speaking and Writing*. Chicago: University of Chicago Press.
- Cheng, L., & Vicente, L. (2008). *Verb Fronting in Mandarin Chinese*. Ms., University of Leiden.
- Chomsky, N.A. (1981). *Lectures on Government and Binding*. Dordrecht: Foris Publications.
- Chomsky, N.A. (1995). *The Minimalist Program*. Cambridge, MA: MIT Press.
- Coerts, J. (1992). *Nonmanual Grammatical Markers. An Analysis of Interrogatives, Negation and Topicalisation in Sign Language of the Netherlands* (Doctoral dissertation). University of Amsterdam.
- Coerts, J. (1994). Constituent order in Sign Language of the Netherlands. In M. Brennan & G. Turner (Eds.), *Word Order Issues in Sign Language: Working Papers (presented at a workshop held in Durham 18-22 September 1991)* (pp. 47–71). Durham: ISLA.
- Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement*, 20(1), 37–46.
- Conlin, F., Hagstrom, P., & Neidle, C. (2003). A particle of indefiniteness in American Sign Language. *Linguistic Discovery*, 2(1), 1–21.
- Corver, N., & Nunes, J. (Eds.) (2007). *The Copy Theory of Movement*. Amsterdam/Philadelphia, John Benjamins.
- Coulter, G.R. (1990). Emphatic stress in ASL. In S.D. Fischer & P. Siple (Eds.), *Theoretical Issues in Sign Language Research, V.1* (pp. 109–125). Chicago: The University of Chicago Press.
- Crasborn, O. (2001). *Phonetic Implementation of Phonological Categories in Sign Language of the Netherlands* (Doctoral dissertation). Utrecht: LOT.
- Crasborn, O. (2006). A linguistic analysis of the use of the two hands in sign language poetry. In: J. van de Weijer & B. Los (Eds.), *Linguistics in the Netherlands 2006* (pp. 65–77). Amsterdam: John Benjamins.
- Crasborn, O. (2007). How to recognise a sentence when you see one. *Sign Language & Linguistics*, 10(2), 103–111.
- Crasborn, O., & van der Kooij, E. (2013). The phonology of focus in Sign Language of the Netherlands. *Journal of Linguistics*, 49(3): 515–565.

- Crasborn, O., van der Kooij, E., Ros, J., & De Hoop, H. (2009). Topic agreement in NGT (Sign Language of the Netherlands). *The Linguistic Review* 26, 355–370.
- Crasborn, O. A., van der Kooij, E., & Ros, J. (2012). On the weight of phrase-final prosodic words in a sign language. *Sign Language & Linguistics*, 15(1): 11–38.
- Crasborn, O., Zwitserlood, I., & Ros, J. (2008). *Corpus NGT. An Open Access Digital Corpus of Movies with Annotations of Sign Language of the Netherlands*. Centre for Language Studies, Radboud University Nijmegen. URL: <http://www.let.ru.nl/corpusngt/>.
- Crasborn, O., & Zwitserlood, I. (2008). The Corpus NGT: an online corpus for professionals and laymen. In O. Crasborn, T. Hanke, E. Efthimiou, I. Zwitserlood & E. Thoutenhoofd (Eds.), *Construction and Exploitation of Sign Language Corpora. 3rd Workshop on the Representation and Processing of Sign Languages* (pp. 44–49). Paros: ELDA.
- Cumberbatch, K. (2013, July). *Challenging the universal on doubling structures*. Poster presented at Theoretical Issues in Sign Language Research 11, London.
- Dachkovsky, S., & Sandler, W. (2009). Visual intonation in the prosody of a sign language. *Language and Speech*, 52(2/3), 287–314.
- Dachkovsky, S., Healy, C., & Sandler, W. (2013). Visual intonation in two sign languages. *Phonology*, 30(2), 211–252.
- Davidson, K. (2012). When disjunction looks like conjunction: pragmatic consequence in ASL. In M. Aloni, V. Kimmelman, F. Roelofsen, G. Weidman Sassoon, K. Schulz & M. Westera (Eds.), *Proceedings of the 18th Annual Amsterdam Colloquium* (pp. 72–81). Berlin: Springer.
- Deuchar, M. (1983). Is BSL an SVO Language? In J. Kyle & B. Woll (Eds.), *Language in Sign* (pp. 69–76). London: Croom Helm.
- Dik, S. (1997). *The Theory of Functional Grammar I. The Structure of the Clause, vol. 1*. Berlin: Mouton de Gruyter.
- Van Dijk, T.A. (1976). *Sentence Topic and Discourse Topic*. Ms., University of Amsterdam.
- Dryer, M.S. (1992). The Greenbergian word order correlations. *Language* 68(1), 81–138.
- Dyakonova, M. (2009). *A Phase-based Approach to Russian Word Order* (Doctoral dissertation). University of Amsterdam. Utrecht: LOT.
- Du Bois, J.W., Cumming, S., Schuetze-Coburn, S., & Paolino, D. (Eds.). (1992). *Discourse Transcription*. Santa Barbara Papers in Linguistics, Volume 4. California, LA: University of California.
- Dudis, P.G. (2004). Body partitioning and real-space blends. *Cognitive Linguistics*, 15(2), 223–238.
- É. Kiss, K. (1995). *Discourse Configurational Languages*. New York, Oxford: Oxford University Press.
- É. Kiss, K. (1997). Discourse-configurationality in the languages of Europe. In A. Siewierska (Ed.), *Constituent Order in the Languages of Europe* (pp. 681–727). Berlin: Mouton de Gruyter.
- Ekman, P. (1979). About brows – emotional and conversational signals. In M. von Cranach, K. Foppa, W. Lepenies & D. Ploog (Eds.), *Human Ethology* (pp. 169–248). Cambridge, MA: Cambridge University Press.
- Ekman, P., & Friesen, W.V. (1978). *Facial Action Coding System*. Palo Alto, CA: Consulting Psychologists Press.
- Elordieta, G. (2008). An overview of theories of the syntax-phonology interface. *ASJU, XLII-1*, 209–286.
- Emmorey, K. (2001). *Language, Cognition, and the Brain: Insights from Sign Language Research*. Mahwah, NJ: Lawrence Erlbaum.
- Emmorey, K., Tversky, B., & Taylor, H.A. (2000). Using space to describe space: Perspective in speech, sign, and gesture. *Spatial Cognition and Computation*, 2(3), 157–180.

- Engberg-Pedersen, E. (1994). Some simultaneous constructions in Danish Sign Language. In M. Brennan & G.H. Turner (Eds.), *Word-order Issues in Sign Language: Working Papers* (pp. 73–88). Durham: ISLA.
- Erteschik-Shir, N. (1997). *The Dynamics of Focus Structure*. Cambridge, MA: Cambridge University Press.
- Féry, C. (2013). Focus as prosodic alignment. *Natural Language and Linguistic Theory*, 31(3), 683–734.
- Fiedler, I., Hartmann, K., Reineke, B., Schwarz, A., & Zimmermann, M. (2010). Subject focus in West African languages. In M. Zimmermann & C. Féry (Eds.), *Information Structure. Theoretical, Typological, and Experimental Perspectives* (pp. 234–257). New York, NY: Oxford University Press.
- Filimonova, E.V. 2012. Sredstva vyrazhenija distirbutivnoj mnozhestvennosti v RZhJa (Expression of distributional plurality in RSL). In O.V. Fedorova (Ed.), *Russkij Zhestovij Jazyk: Pervaja Lingvisticheskaja Konferentsija* (Russian Sign Language: The first linguistic conference) (pp. 82–97). Moscow.
- Filipczak, J., & Mostowski, P. (2013, July). *Repetition in Polish Sign Language (PJM). Discourse – grammar – information structure?* Poster presented at Theoretical Issues in Sign Language Research 11, London.
- Fischer, S. (1974). Sign language and linguistic universals. In T. Rohrer & N. Ruwet (Eds.), *Actes de Colloque Franco-Allemand de Grammaire Transformationnelle. II. Etudes de Sémantique et Autres* (pp.187–204). Tübingen: Niemeyer [Re-printed 2008 in *Sign Language & Linguistics* 11(2), 245–262].
- Fischer, S. (1978). Sign language and creoles. In P. Siple (Ed.) *Understanding Language through Sign Language Research* (pp. 309–331). New York: Academic Press.
- Fischer, S., & Janis, W. (1990). Verb sandwiches in American Sign Language. In S. Prillwitz & T. Vollhaber (Eds.), *Current Trends in European Sign Language Research: Proceedings of the third European Congress on Sign Language Research* (pp. 279–294). Hamburg: Signum,
- Fleiss, J.L., Levin, B., & Paik, M.C. (2003). *Statistical Methods for Rates and Proportions*, 3rd ed. Hoboken: John Wiley & Sons.
- Foley, W., & Van Valin, R. (1985). Information packaging in the clause. In T. Shopen (Ed.), *Language Typology and Syntactic Description, Vol I: Clause Structure* (pp. 282–364). Cambridge: Cambridge University Press.
- Freleng, F. (1950). *Canary Row* [film, animated cartoon]. New York: Time Warner.
- Friedman, L. A. (1976). The manifestation of subject, object, and topic in the American Sign Language. In C.N. Li (Ed.), *Subject and Topic* (pp. 125–148). New York: Academic.
- Frishberg, N. (1985). Dominance relations & discourse structures. In W. Stokoe & V. Volterra (Eds.), *SLR '83: Proceedings of the III. International Symposium on Sign Language Research* (pp. 79–90). Silver Spring, MD: Linstok Press.
- Geraci, C., Gozzi, M., Papagno, C., & Cecchetto, C. (2008). How grammar can cope with limited short-term memory: Simultaneity and seriality in sign languages. *Cognition* 106(2), 780–804.
- Van Gijn, I. (2004). *The Quest for Syntactic Dependency: Sentential Complementation in Sign Language of the Netherlands (NGT)* (Doctoral dissertation). Utrecht: LOT.
- Grenoble, L. (1992). An overview of Russian Sign Language. *Sign Language Studies*, 77, 321–338.
- Gries, S.T. (2009). *Statistics for Linguistics with R: a Practical Introduction*. Berlin: Walter de Gruyter.
- Grosjean, F., & Lane, H. (1977). Pauses and syntax in ASL. *Cognition*, 5(2), 101–117.

- Gundel, J.K. (1988). Universals of topic-comment structure. In M. Hammond, E.A. Moravcsik & J.R. Wirth (Eds.), *Studies in Syntactic Typology* (pp. 209–239). Amsterdam: John Benjamins.
- Hartmann, K., & Zimmermann, M. (2007). In place – out of place? Focus in Hausa. In K. Schwabe & S. Winkler (Eds.), *On Information Structure, Meaning and Form: Generalizing Across Languages* (pp. 365–403). Amsterdam: John Benjamins.
- Hendriks, B. (2007). Simultaneous use of the two hands in Jordanian Sign Language. In M. Vermeerbergen, L. Leeson & O. Crasborn (Eds.), *Simultaneity in Sign Languages: Form and Function* (pp. 237–255). Amsterdam: John Benjamins.
- Herrmann, A. (2010). The interaction of eye blinks and other prosodic cues in German Sign Language. *Sign Language & Linguistics*, 13(3): 3–39.
- Herrmann, A. (2013). *Modal and Focus Particles in Sign Languages. A Cross-Linguistic Study*. Berlin: Mouton de Gruyter.
- Hopper, P.J., & Traugott, E.C. (2003). *Grammaticalization*. Cambridge: Cambridge University Press.
- Hróarsdóttir, T. (2001). *Word Order Change in Icelandic: from OV to VO*. Amsterdam: John Benjamins.
- Ingram, R.M. (1978). Theme, rheme, topic, and comment in the syntax of American Sign Language. *Sign Language Studies*, 20(1): 193–218.
- Jacobs, J. (2001). The dimensions of topic-comment. *Linguistics*, 39(4): 641–681.
- Jantunen, T. (2007). *On topic in Finnish Sign Language*. Ms., University of Jyväskylä, Finland [Available at: http://users.jyu.fi/~tojantun/articles/JAN_topic_ms.pdf].
- Jantunen, T. (2013). Ellipsis in Finnish Sign Language. *Nordic Journal of Linguistics*, 36(3): 303–332.
- Janzen, T. (1999). The grammaticization of topics in American Sign Language. *Studies in Language*, 23(2), 271–306.
- Janzen, T. (2012). Lexicalization and grammaticalization. In R. Pfau, M. Steinbach & B. Woll (Eds.), *Sign Language. An International Handbook (HSK - Handbooks of Linguistics and Communication Science)* (pp. 816–840). Berlin: Mouton de Gruyter.
- Johnston, T. (2013). Formational and functional characteristics of pointing signs in a corpus of Auslan (Australian Sign Language): are the data sufficient to posit a grammatical class of pronouns in Auslan? *Corpus Linguistics and Linguistic Theory*, 9(1), 109–159.
- Johnston, T., & Schembri, A. (2007). *Australian Sign Language. An Introduction to Sign Language Linguistics*. Cambridge: Cambridge University Press.
- Van der Hulst, H. (1996). On the other hand. *Lingua*, 98(1), 121–143.
- Kandybowicz, J. (2006). *Conditions on Multiple Spell-out and the Syntax-Phonology Interface* (Unpublished doctoral dissertation). University of California, Los Angeles.
- Kandybowicz, J. (2007). On fusion and multiple copy spell-out. The case of verbal repetition. In N. Corver & J. Nunes (Eds.), *The Copy Theory of Movement* (119–150). Amsterdam: John Benjamins.
- Karppa, M., Jantunen, T., Viitaniemi, V., Laaksonen, J., Burger, B., & de Weerdt, D. (2012). Comparing computer vision analysis of signed language video with motion capture recordings. In *Proceedings of 8th Language Resources and Evaluation Conference (LREC 2012)*. Available online at http://www.lrec-conf.org/proceedings/lrec2012/pdf/321_Paper.pdf.
- Kayne, R. (1994). *The Antisymmetry of Syntax*. Cambridge, MA: MIT Press.
- Kegl, J. (1985). *Locative Relations in American Sign Language: Word Formation, Syntax, and Discourse* (Unpublished doctoral dissertation). MIT, Boston.
- Kendon, A. (2004). *Gesture: Visible Action as Utterance*. Cambridge, MA: Cambridge University Press.

- Kendon, A. (2008). Some reflections on the relationship between 'gesture' and 'sign'. *Gesture*, 8(3), 348–366.
- Kibrik, A.A., & Podlesskaja, V.I. (Eds.). (2009). *Rasskazy o Snovidenijah: Korpusnoe Issledovanie Ustnogo Russkogo Diskursa* (Night dream stories: corpus study of spoken Russian discourse). Moscow: Jazyki Slav'sanskij Kul'tury.
- Kilian-Hatz, C. (2006). Serial verb constructions in Khwe (Central Khoisan). In A.Y. Aikhenvald & R.M.W. Dixon (Eds.), *Serial Verb Constructions* (pp. 108–123). Oxford: Oxford University Press.
- Kimmelman, V. (2007). *Vyraženie otritsanija v russkom žestovom jazyke* (Expression of negation in Russian Sign Language). (Term paper). Russian State University for the Humanities, Moscow.
- Kimmelman, V. (2009a). Parts of speech in Russian Sign Language: The role of iconicity and economy. *Sign Language & Linguistics*, 12(2), 161–186.
- Kimmelman, V. (2009b). *Reflexive pronouns in Russian Sign Language and Sign Language of the Netherlands* (MA thesis). Universiteit van Amsterdam, Amsterdam.
- Kimmelman, V. (2009c). On the interpretation of èto in so-called èto-clefts. In G. Zybatow, D. Lenertová, U. Junghanns & P. Biskup (Eds.), *Studies in Formal Slavic Phonology, Morphology, Syntax, Semantics and Information Structure: Proceedings of FDSL 7, Leipzig 2007* (pp. 319–329). Frankfurt: Peter Lang.
- Kimmelman, V. (2012a). Word order in Russian Sign Language: an extended report. *Linguistics in Amsterdam*, 5(1), 1–55.
- Kimmelman, V. (2012b). Doubling in RSL and NGT: Towards a unified explanation. In E. Cohen (Ed.), *Proceedings of IATL 2011* (pp. 57–81). Cambridge, MA: MITWPL.
- Kimmelman, V. (2013). Doubling in RSL and NGT: a pragmatic account. In F. Bildhauer & M. Grubic (Eds.), *Working Papers of the SFB632, Interdisciplinary Studies on Information Structure (ISIS)*, Vol 17 (pp. 99–118). Potsdam: Universitätsverlag Potsdam.
- Kimmelman, V. to appear. Multiple tiers, multiple trees. Weak hand holds in Russian Sign Language. In *Proceedings of CLS 49*.
- Kimmelman, V., & Pfau, R. (to appear). Information structure in sign languages. In: C. Fery & S. Ishihara (Eds.), *The Oxford Handbook on Information Structure*. Oxford: Oxford University Press.
- Kimmelman, V., & Sáfár, A. (2013). *Weak hand holds in RSL and NGT: Functional Analysis*. Ms, University of Amsterdam and Radboud University Nijmegen.
- Knoors, H., & Marschark, M. (2012). Language planning for the 21st century: Revisiting bilingual language policy for Deaf children. *Journal of Deaf Studies and Deaf Education*, 17(3), 291–305.
- Koch, K.A. (2008). Focus projection in Nlẽʔkepmxcin. In C.D. Chang & H.J. Haynie (Eds.), *Proceedings of the 26th West Coast Conference of Formal Linguistics* (pp. 348–356). Somerville, MA: Cascadia Proceedings Project.
- Van der Kooij, E. (2002). *Phonological Categories in Sign Language of the Netherlands. The Role of Phonetic Implementation and Iconicity* (Doctoral dissertation). Utrecht: LOT.
- Van der Kooij, E., Crasborn, O., & Emmerik, W. (2006). Explaining prosodic body leans in Sign Language of the Netherlands: pragmatics required. *Journal of Pragmatics*, 38(10), 1598–1614.
- Krifka, M. (2008). Basic notions of Information Structure. *Acta Linguistica Hungarica*, 55(3-4), 243–276.
- Krifka, M. to appear. Quantification and Information Structure. In C. Fery & S. Ishihara (Eds.), *The Oxford Handbook on Information Structure*. Oxford: Oxford University Press.
- Lambrecht, K. (1994). *Information Structure and Sentence Form*. Cambridge, MA: Cambridge University Press.

- Landis, J.R., & Koch, G.G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159–174.
- Lane, H. (2005). Ethnicity, ethics and the Deaf-World. *Journal of Deaf Studies and Deaf Education*, 10(3), 291–310.
- Langendoen, T. (2003). Merge. In A. Carnie, H. Harley & M. Willie (Eds.), *Formal Approaches to Function in Grammar: In Honor of Eloise Jelinek* (pp. 307–318). Amsterdam: John Benjamins.
- Leeson, L., & Saeed, J. (2012). Word order. In R. Pfau, M. Steinbach & B. Woll (Eds.), *Sign Language. An International Handbook (HSK - Handbooks of Linguistics and Communication Science)* (pp. 245–265). Berlin: Mouton de Gruyter.
- Lefebvre, C. (2004). *Issues in the Study of Pidgin and Creole Languages*. Amsterdam: John Benjamins.
- Levelt, W. (1983). Monitoring and self-repair in speech. *Cognition* 14(1), 41–104.
- Li, C., & Thompson, S. (1976). Subject and topic: a new typology of language. In C. Li & S. Thompson (Eds.), *Subject and Topic* (pp. 456–489). New York: Academic Press.
- Liddell S.K. (1978). Nonmanual signals and relative clauses in American Sign Language. In Siple, P. (Ed.), *Understanding Language Through Sign Language Research* (pp. 59–90). New York: Academic Press.
- Liddell, S.K. (1980). *American Sign Language Syntax*. The Hague: Mouton.
- Liddell, S.K. (2003). *Grammar, Gesture and Meaning in ASL*. Cambridge: Cambridge University Press.
- Liddell, S.K., Vogt-Svendsen, M., & Bergman, B. (2007). A crosslinguistic comparison of buoys. Evidence from American, Norwegian, and Swedish Sign Language. In M. Vermeerbergen, L. Leeson & O. Crasborn (Eds.), *Simultaneity in Sign Languages: Form and Functions* (pp. 187–215). Amsterdam: John Benjamins.
- Lillo-Martin, D. (1995). The point of view predicate in American Sign Language. In K. Emmorey & J. Reilly (Eds.), *Language, Gesture and Space* (pp. 155–170). Hillsdale: Lawrence Erlbrawn Associates.
- Lillo-Martin, D. (2012). Utterance reports and constructed action. In R. Pfau, M. Steinbach & B. Woll (Eds.), *Sign Language. An International Handbook (HSK - Handbooks of linguistics and communication science)* (pp. 365–387). Berlin: Mouton de Gruyter.
- Lillo-Martin, D., & Meier, R.P. (2011). On the linguistic status of ‘agreement’ in sign languages. *Theoretical Linguistics*, 37(3–4), 95–141.
- Lillo-Martin, D., & de Quadros, R.M. (2008). Focus constructions in American Sign Language and Lingua de Sinais Brasileira. In J. Quer (Ed.), *Signs of the Time. Selected Papers from TISLR 8* (pp. 161–176). Hamburg: Signum.
- Van Loon, E. (2012). *What's in the Palm of your Hands? Discourse Functions of PALM-UP in Sign Language of the Netherlands* (MA thesis). University of Amsterdam, Amsterdam.
- Lucas, C., Bayley, R., & Valli, C. (2001). *Sociolinguistic Variation in ASL (Sociolinguistics in Deaf Communities, vol. 7)*. Washington, DC: Gallaudet University Press.
- Lupyan, G., & Dale, R. (2010). Language structure is partly determined by social structure. *PLoS ONE* 5(1): e8559. doi:10.1371/journal.pone.0008559
- Martins, A.M. (2007). Double realization of verbal copies in European Portuguese emphatic affirmation. In N. Corver & J. Nunes (Eds.), *The Copy Theory of Movement* (pp. 77–118). Amsterdam, John Benjamins.
- Mayberry, R. (2007). When timing is everything: Age of first-language acquisition effects on second-language learning. *Applied Psycholinguistics* 28(3), 537–549.
- McBurney, S. (2012). History of sign languages and sign language linguistics. In R. Pfau, M. Steinbach & B. Woll (Eds.), *Sign Language. An International Handbook (HSK -*

- Handbooks of Linguistics and Communication Science*) (pp. 909–948). Berlin: Mouton de Gruyter.
- McClave, E.Z. (2000). Linguistic functions of head movements in the context of speech. *Journal of Pragmatics*, 32(7), 855–878.
- McIntire, M. (1982). Constituent order and location in American Sign Language. *Sign Language Studies*, 37(1), 345–386.
- McKee, R.L., & Wallingford, S. (2011). ‘So, well, whatever’: Discourse functions of palm-up in New Zealand Sign Language. *Sign Language & Linguistics*, 14(2), 213–247.
- McNeill, D. (1992). *Hand and Mind*. Chicago: University of Chicago Press.
- McShane, M.J. (2005). *Theory of Ellipsis*. Cary, NC: Oxford University Press.
- Meier, R.P. (2002). Why different, why the same? Explaining effects and non-effects of modality upon linguistic structure in sign and speech. In R.P. Meier, K.A. Cormier & D.G. Quinto-Pozos (Eds.), *Modality and Structure in Signed and Spoken Languages* (pp. 1–25). Cambridge: Cambridge University Press.
- Meier, R.P. (2012). Language and modality. In R. Pfau, M. Steinbach & B. Woll (Eds.), *Sign Language. An International Handbook (HSK - Handbooks of Linguistics and Communication Science)* (pp. 574–601). Berlin: Mouton de Gruyter.
- Meir, I. (2012). Word classes and word formation. In R. Pfau, M. Steinbach & B. Woll (Eds.), *Sign Language. An International Handbook (HSK - Handbooks of Linguistics and Communication Science)* (pp. 77–112). Berlin: Mouton de Gruyter.
- Meir, I., & Sandler, W. (2008). *A Language in Space: The Story of Israeli Sign Language*. New York: Lawrence Erlbaum Associates.
- Mesch, J., & Wallin, L. (2013, July). *The non-dominant hand as delimitation between inner element and outer element*. Poster presented at Theoretical Issues in Sign Language Research (TISLR 11), London.
- Miller, C. (1994a). Simultaneous constructions in Quebec Sign Language. In M. Brennan & G.H. Turner (Eds.), *Word-order Issues in Sign Language* (pp. 89–112). Durham: ISLA.
- Miller, C. (1994b). Simultaneous constructions and complex signs in Quebec Sign Language. In I. Ahlgren, B. Bergman & M. Brennan (Eds.), *Perspectives on Sign Language Structure* (pp. 129–148). Durham: ISLA.
- Miller, C. (2000, July). *Multi-channel constructions and universal syntax*. Paper presented at the 7th International Conference on Theoretical Issues in Sign Language Research. Amsterdam.
- Molnár, V. (2001). Contrast from a contrastive perspective. In I. Kruijf-Korbayová & M. Steedman (Eds.), *Information Structure, Discourse Structure and Discourse Semantics* (pp. 99–114). Utrecht: ESSLI.
- Neidle, C. (2002). Language across modalities: ASL focus and question constructions. *Linguistic Variation Yearbook*, 2(1), 71–98.
- Neidle, C., Kegl, J., MacLaughlin, D., Bahan, B., & Lee, R.G. (2000). *The Syntax of American Sign Language: Functional Categories and Hierarchical Structure*. Cambridge, MA: MIT Press.
- Nespor, M., & Sandler, W. (1999). Prosody in Israeli Sign Language. *Language and Speech*, 42(2): 143–176.
- Nilsson, A.-L. (2007). The non-dominant hand in a Swedish Sign Language discourse. In M. Vermeerbergen, L. Leeson & O. Crasborn (Eds.), *Simultaneity in Sign Languages: Form and Functions* (pp. 163–185). Amsterdam: John Benjamins.
- Nunes, J. (2004). *Linearization of Chains and Sideward Movement*. Cambridge, MA: MIT Press.

- Nunes, J., & de Quadros, R.M. (2008). Phonetically realized traces in American Sign Language and Brazilian Sign Language. In J. Quer (Ed.), *Signs of the Time. Selected papers from TISLR 8* (pp. 177–190). Hamburg: Signum.
- Nyst, V. (2007). Simultaneous constructions in Adamorobe Sign Language (Ghana). In M. Vermeerbergen, L. Leeson & O. Crasborn (Eds.), *Simultaneity in Sign Languages: Form and Functions* (pp. 128–145). Amsterdam: John Benjamins.
- Ormel, E., & Crasborn, O. (2012). Prosodic correlates of sentence in signed languages: A literature review and suggestions for new types of studies. *Sign Language Studies*, 12(2), 109–145.
- Padden, C.A. (1988). *Interaction of Morphology and Syntax in American Sign Language: Outstanding Dissertations in Linguistics*. New York: Garland.
- Perniss, P., & Özyürek, A. (2008). Representations of action, motion, and location in sign space: A comparison of German (DGS) and Turkish (TİD) Sign Language narratives. In J. Quer (Ed.), *Signs of the Time: Selected Papers from TISLR 8* (pp. 353–378). Hamburg: Signum.
- Perniss, P., Thompson, R.L., & Vigliocco, G. (2010). Iconicity as a general property of language; evidence from spoken and signed languages. *Frontiers in Psychology*, 1, 227.
- Petronio, K. (1991). A focus position in ASL. In J.D. Bobaljik & T. Bures (Eds.), *Papers from the Third Student Conference in Linguistics 1991 (MIT Working Papers in Linguistics 14)* (pp. 211–225). Cambridge, MA: MITWPL.
- Petronio, K. (1993). *Clause Structure in American Sign Language* (Unpublished doctoral dissertation). University of Washington, Seattle.
- Pinsonneault, D. (1994). Verb echoes in LSQ. In M. Brennan & G.H. Turner (Eds.), *Word-order Issues in Sign Language* (pp. 114–131). Durham: ISLA.
- Pfau, R., & Aboh, E.O. (2012). On the syntax of spatial adpositions in sign languages. In E. Cohen (Ed.), *Proceedings of IATL 2011* (pp. 83–104). Cambridge, MA: MITWPL.
- Pfau, R., & Quer, J. (2010). Nonmanuals: their prosodic and grammatical roles. In D. Brentari (Ed.), *Sign Languages (Cambridge Language Surveys)* (pp. 381–402). Cambridge: Cambridge University Press.
- Pfau, R., & Steinbach, M. (2005). Relative clauses in German Sign Language: extraposition and reconstruction. In L. Bateman & C. Ussery (Eds.), *Proceeding of the North East Linguistic Society (NELS 359)*, Vol. 2 (pp. 507–521). Amherst, MA: GLSA.
- Pfau, R., & Steinbach, M. (2006). Pluralization in sign and speech: Across-modal typological study. *Linguistic Typology*, 10(2), 135–182.
- Pfau, R., & Steinbach, M. (2011). Grammaticalization in sign languages. In H. Narrog & B. Heine (Eds.), *The Oxford Handbook of Grammaticalization* (pp. 683–695). Oxford: Oxford University Press.
- Pfau, R., Steinbach, M., & Woll, B. (Eds.) (2012). *Sign Language. An International Handbook (HSK - Handbooks of Linguistics and Communication Science)*. Berlin: Mouton de Gruyter.
- Potts, C. (2005). *The Logic of Conventional Implicatures*. Oxford: Oxford University Press.
- Prince, E. (1986). On the syntactic marking of presupposed open propositions. In A.M. Farley (Ed.), *Papers from the Parasession on Pragmatics and Grammatical Theory, 22nd Regional Meeting* (pp. 208–222). Chicago: Chicago Linguistic Society.
- Prozorova, E.V. (2004). *Morfologičeskaja složnost' glagolov v russkom žestovom jazyke* (Morphological complexity of verbs in Russian Sign Language) (Term paper). Moscow State University, Moscow.
- Prozorova, E.V. (2009). *Markery lokal'noy struktury diskursa v russkom žestovom jazyke* (Markers of local discourse structure in Russian Sign Language) (Unpublished doctoral Dissertation). Moscow State University, Moscow.

- Prozorova E.V., & Kibrik, A.A. (2007). Referential choice in signed and spoken languages. In A. Branco, T. McEnery, R. Mitkov & F. Silva (Eds.), *DAARC 2007 (6th Discourse Anaphora and Anaphor Resolution Colloquium)* (pp. 41–46). Porto: Centro de Linguística da Universidade do Porto.
- Pursglove, M., & Komarova, A. (2003). The changing world of the Russian Deaf community. In L. Monaghan, C. Schmalin, K. Nakamura & G.H. Turner (Eds.), *Many Ways to be Deaf* (pp. 249–259). Washington.: Gallaudet University Press.
- De Quadros, R.M. (1999). *Phrase Structure of Brazilian Sign Language* (Unpublished doctoral dissertation). Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre.
- Reinhart, T. (1982). Pragmatics and linguistics. An analysis of sentence topics. *Philosophica*, 27(1), 53–94.
- Van Riemsdijk, H. (2006). Grafts follow from Merge. In M. Frascarelli (Ed.), *Phases of Interpretation* (pp. 17–44). Berlin: Walter de Gruyter.
- Rooth, M. (1992). A theory of focus interpretation. *Natural Language Semantics* 1, 75–116.
- Rosenstein, O. (2001). *Israeli Sign Language – a Topic Prominent Language* (MA Thesis). Haifa University, Haifa.
- Sáfár, A. (2012). Ambidextrous signers in the Corpus NGT. In É. Illés & T. Eitler (Eds.), *Studies in Applied Linguistics in Honour of Edit H. Kontra* (pp. 123–132). Budapest: ELTE BTK.
- Sáfár, A. (2013). *Handedness in Deaf Signers: the Corpus NGT and Beyond*. Ms., Radboud University Nijmegen.
- Sáfár, A., & Crasborn, O. (2013). A corpus-based approach to manual simultaneity. In L. Meurant, A. Sinte, M. van Herreweghe & M. Vermeerbergen (Eds.), *Sign Language Research, Uses and Practices: Crossing Views on Theoretical and Applied Sign Language Linguistics* (pp. 179–203). Berlin: Mouton de Gruyter.
- Sáfár, A., & Kimmelman V. (2013). *Weak Hand Holds in NGT and RSL. Quantitative Analysis*. Ms., Radboud University Nijmegen & University of Amsterdam.
- Sáfár, A., Meurant, L., Haesenne, T., Nauta, Y. E., de Weerdt, D., & Ormel, E. (in press). Mutual intelligibility among the sign languages of Belgium and the Netherlands. *Linguistics* 53(2).
- Sallandre, M.-A. (2003). *Les Unités du Discours en Langue des Signes Française. Tentative de Catégorisation dans le Cadre d'une Grammaire de l'Iconicité. [Units of Discourse in French Sign Language: An Attempt at Categorization in the Framework of a Grammar of Iconicity]* (Doctoral dissertation). Université Paris VIII Vincennes-Saint Denis, Paris. Retrieved from <http://tel.archives-ouvertes.fr/tel-00185376/> (Last accessed: 12 June 2013.)
- Sandler, W. (1989). *Phonological Representation of the Sign: Linearity and Nonlinearity in American Sign Language*. Dordrecht: Foris.
- Sandler, W., & Lillo-Martin, D. (2006). *Sign Language and Linguistic Universals*. Cambridge, UK: Cambridge University Press.
- Sankoff, G., & Brown, P. (1976). The origins of syntax in discourse. *Language*, 52(3), 631–666.
- Šarac, N., Schalber, K., Alibašić Ciciliani, T., & Wilbur, R.B. (2007). Cross-linguistic comparison of sign language interrogatives. In P. Perniss, R. Pfau & M. Steinbach (Eds.), *Visible Variation: Comparative Studies on Sign Language Structure* (pp. 207–244). Berlin: Mouton de Gruyter.
- Sasse, H.-J. (1987). The thematic/categorical distinction revisited. *Linguistics*, 25(3), 511–580.
- Schermer, T. (2004). Lexical variation in Sign Language of the Netherlands. In M. van Herreweghe & M. Vermeerbergen (Eds.), *To the Lexicon and Beyond: Sociolinguistics in European Deaf Communities* (pp. 94–110). Washington DC: Gallaudet University Press.

- Schermer, T., Fortgens, C., Harder, R., & de Nobel, E. (Eds.). (1991). *De Nederlandse Gebarentaal*. Twello: Van Tricht.
- Schiffrin, D. (1994). *Approaches to Discourse*. Oxford & Cambridge: Blackwell.
- Schuit, J.M. (2013). *Signs of the Arctic: Typological Aspects of Inuit Sign Language* (Doctoral dissertation). University of Amsterdam.
- Seidl, A. (2001). *Minimal Indirect Reference: A Theory of the Syntax-phonology Interface*. London: Routledge.
- Selkirk, E. (1995). Sentence prosody: Intonation, stress, and phrasing. In J. Goldsmith (Ed.), *The Handbook of Phonological Theory* (pp. 550–569). Cambridge, MA: Blackwell.
- Senghas, A., Kita, S., & Özyürek, A. (2004). Children creating core properties of language: Evidence from an emerging sign language in Nicaragua. *Science*, 305(5691), 1779–1782.
- Shamaro, E.Ju. (2006). *Vyraženije prošedšego vremeni i bazovyh aspektual'nyh različij v rossijskom (russkom) žestovom jazyke* (Expression of past tense and basic aspectual differences in Russian Sign Language) (Term paper). Moscow State University, Moscow.
- Shamaro, E.Ju. 2008. *Dublirovanie predikata v diskurse russkogo žestovogo jazyka* (Doubling of predicates in Russian Sign Language discourse) (Term paper). Moscow State University, Moscow.
- Skopeteas, S., Fiedler, I., Hellmuth, S., Schwarz, A., Stoel, R., Fanselow, G., Féry, C., & Krifka, M. (2006). Questionnaire on Information Structure: Reference Manual. In *Quantificational Variability Effects with Plural Definites*, Interdisciplinary Studies on Information Structure (ISIS) 4. Potsdam: Universitätsverlag Potsdam.
- Slioussar, N. (2007). *Grammar and Information Structure. A Study with Reference to Russian* (Doctoral dissertation). Utrecht: LOT.
- Slobin, D.I. (in press). Typology and channel of communication: where do signed languages fit in? In B. Bickel, L. Grenoble, D.A. Peterson & A. Timberlake (Eds.), *What's Where Why? Language Typology and Historical Contingency: A Festschrift to Honor Johanna Nichols*.
- Smit, N. (2010). *FYI. Theory and Typology of Information Packaging* (Doctoral dissertation). Universiteit van Amsterdam.
- Stalnaker, R. (1974). Pragmatic presuppositions. In: M. Munitz & P. Unger (Eds.), *Semantics and Philosophy* (pp. 197–213). New York, NY: New York University Press.
- Stokoe, W.C. (1960). Sign language structure: An outline of the visual communication system of the American Deaf. *Studies in Linguistics, Occasional Papers No. 8*. Buffalo, NY: University of Buffalo.
- Supalla, T. (1990). Serial verbs of motion in ASL. In S.D. Fischer & P. Siple (Eds.), *Theoretical Issues in Sign Language Research, Vol. 1: Linguistics* (pp. 127–152). Chicago, IL: University of Chicago Press.
- Surány, B. (to appear). Discourse-configurationality. In C. Féry & S. Ishihara (Eds.), *The Oxford Handbook on Information Structure*. Oxford: Oxford University Press.
- De Swart, H.E., & de Hoop, H. (2000). Topic and focus. In L. Cheng & R. Sybesma (Eds.), *The First Glot International State-of-the-Article Book* (pp. 105–130). Berlin/New York: Mouton de Gruyter.
- Sze, F.Y.B. (2008a). Blinks and intonational phrasing in Hong Kong Sign Language. In J. Quer (Ed.), *Signs of the Time. Selected Papers from TISLR 2004* (pp. 83–107). Hamburg: Signum.
- Sze, F.Y.B. (2008b). *Topic Constructions in Hong Kong Sign Language* (Unpublished doctoral dissertation). University of Bristol, Bristol.
- Sze, F.Y.B. (2011). Nonmanual markings for topic constructions in Hong Kong Sign Language. *Sign Language & Linguistics*, 14(1), 115–147.

- Terpstra, A., & Schermer, T. (2006). Wat is NmG en waarom gebruik je het. *Van Horen Zeggen. Februari 2006*, 10–17.
- Todd, P. (2008). ASL ‘topics’ revisited. *Sign Language & Linguistics*, 11(2), 184–239.
- Tsypenko, A. (2008). *Genitivnaja konstruksija v russkom žestovom jazyke* (Genitive construction in Russian Sign Language) (Term paper). Moscow State University, Moscow.
- Uebersax, J. (2014, January). *Statistical Methods for Rater and Diagnostic Agreement*. Retrieved from: <http://www.john-uebersax.com/stat/agree.htm>
- Vallduví, E. (1992). *The Information Component* (Doctoral dissertation). University of Pennsylvania. New York, NY: Garland Press.
- Vallduví, E., & Vilks, M. (1998). On rheme and kontrast. In P. Culicover & L. McNally (Eds.), *The Limits of Syntax* (pp. 79–106). New York: Academic Press.
- Van Ingen, D. (2010). *Seriële werkwoorden in gebarentaal* (Bachelor thesis). University of Amsterdam.
- Vermeerbergen, M., & Demey, E. (2007). Sign + gesture = speech + gesture. Comparing aspects of simultaneity in Flemish Sign Language to instances of concurrent speech and gesture. In M. Vermeerbergen, L. Leeson & O. Crasborn (Eds.), *Simultaneity in Sign Languages: Form and Functions* (pp. 257–282). Amsterdam: John Benjamins.
- Viktorova, S.V. (2007). *Voprositel’nye mestoimenija v rossijskom (russkom) žestovom jazyke*. (Question words in Russian Sign Language) (Term paper). Moscow State University, Moscow.
- Vogt-Svendsen, M., & Bergman, B. (2007). Point buoys. The weak hand as a point of reference for time and space. In M. Vermeerbergen, L. Leeson & O. Crasborn (Eds.), *Simultaneity in Sign Languages: Form and Functions* (pp. 217–235). Amsterdam: John Benjamins.
- De Vos, C., van der Kooij, E., & Crasborn, O. (2009). Mixed signals: combining linguistics and affective functions of eyebrows in questions in Sign Language of the Netherlands. *Language and Speech*, 52(2/3), 315–339.
- De Vries, M. (2008). Asymmetric Merge and parataxis. *Canadian Journal of Linguistics*, 53(2): 355–385.
- De Vries, M. (2009). On multidominance and linearization. *Biolinguistics*, 3(4), 344–403.
- De Vries, M. (2012). Unconventional merges. In M. Uribe-Etxebarria & V. Valmala (Eds.), *Ways of Structure Building* (pp. 143–166). Oxford: Oxford University Press.
- Waleschkowski, E. (2009, April). *Focus in German Sign Language*. Poster presented at the Workshop ‘Nonmanuals in Sign Languages’, Frankfurt am Main.
- Waleschkowski, E. (2011). *Focus Marking in German Sign Language*. Ms., University of Frankfurt/Main.
- Weast, T.P. (2008). *Questions in American Sign Language: a Quantitative Analysis of Raised and Lowered Eyebrows* (Unpublished doctoral Dissertation). University of Texas, Texas.
- Wilbur, R.B. (1994). Foregrounding structures in ASL. *Journal of Pragmatics*, 22(6), 647–672.
- Wilbur, R.B. (1996). Evidence for the function and structure of wh-clefts in American Sign Language. In W.H. Edmondson & R.B. Wilbur (Eds.), *International Review of Sign Linguistics* (pp. 209–256). Mahwah, NJ: Erlbaum.
- Wilbur, R.B. (1997). A prosodic/pragmatic explanation for word order variation in ASL with typological implications. In K. Lee, E. Sweetser & M. Verspoor (Eds.), *Lexical and Syntactic Constructions and the Constructions of Meaning* (pp. 89–104). Amsterdam: John Benjamins.
- Wilbur, R.B. (1999). Stress in ASL: empirical evidence and linguistic issues. *Language and Speech*, 42(2–3), 229–250.

- Wilbur, R.B. (2012). Information Structure. In R. Pfau, M. Steinbach & B. Woll (Eds.), *Sign Language. An International Handbook (HSK - Handbooks of Linguistics and Communication Science)* (pp. 462–489). Berlin: Mouton de Gruyter.
- Wilbur, R.B., & Patschke, C.G. (1998). Body leans and the marking of contrast in American Sign Language. *Journal of Pragmatics*, 30(3), 275–303.
- Wilbur, R.B., & Patschke, C.G. (1999). Syntactic correlates of brow raise in ASL. *Sign Language & Linguistics*, 2(1), 3–41.
- Wilbur, R.B., & Schick, B.S. (1987). The effects of linguistic stress on ASL signs. *Language and Speech*, 30(4), 301–323.
- Wingerden, M.R.-v. (2003). Educating the deaf in the Netherlands: a methodological controversy in historical perspective. *History of Education*, 32(4), 401–416.
- Woll, B. (2007). Perspectives on linearity and simultaneity. In M. Vermeerbergen, L. Leeson & O. Crasborn (Eds.), *Simultaneity in Sign Languages: Form and Functions* (pp. 337–344). Amsterdam: John Benjamins.
- Woll, B., & Sieratzki, J.S. (1998). Echo phonology: Signs of a link between gesture and speech. *Behavioral and Brain Sciences*, 21(4), 531–532.
- Zajtseva, G.L. (1987). Problems of sign language in the Soviet Deaf education. In J. Kyle (Ed.), *Sign and School: Using Signs in Deaf Children's Development* (pp. 100–108). Clevedon: Multilingual Matters.
- Zeshan, U. (2004). Interrogative constructions in signed languages: Crosslinguistic perspectives. *Language*, 80(1), 7–39.
- Zeshan, U. (2006). Negative and interrogative constructions in sign languages: A case study in sign language typology. In: U. Zeshan (Ed.), *Interrogative and Negative Constructions in Sign Languages* (pp. 28–68). Nijmegen: Ishara Press.
- Zeshan, U. (2008). Roots, leaves and branches – The typology of sign languages. In R.M. de Quadros (Ed.), *Sign languages: spinning and unraveling the past, present and future* (pp. 671–695). Petrópolis: Editora Arara Azul.
- Zeshan, U., & Perniss, P. (Eds.). (2008). *Possessive and Existential Constructions in Sign Languages*. Nijmegen: Ishara Press.

Summary

The present dissertation explores Information Structure (IS) in two unrelated sign languages: Sign Language of the Netherlands (*Nederlandse Gebarentaal*, NGT) and Russian Sign Language (RSL). We study the expression of IS in RSL and NGT, investigate the similarities and differences between the two languages, and discuss the data within a typological framework; in addition, we assess the modality effects in this domain.

This is an original contribution to sign language typology since these two languages have not been compared before in the area of IS. It is also for the first time that a deep exploration has been carried out into the IS-related forms and functions in these two sign languages in search for possible universal and modality-specific aspects. Finally, the analysis is based on corpus data and involves both quantitative and qualitative descriptions.

The **first chapter** of the dissertation introduces the main notions and research questions. First, the importance of studying sign languages is emphasized: in order to understand the human language capacity, to make both typological generalizations and to develop theoretical models of language, cross-linguistic data, including sign language data, are indispensable. Previous research on sign languages, with a focus on comparative studies and sign language typology, is also discussed in this chapter. Additionally, we address the fact that sign languages exist in the visual-spatial modality, which has its effects on the grammar and use of these languages in comparison to spoken languages. Possible modality effects will therefore be examined in the domain of IS as well.

This chapter also provides the necessary background on RSL and NGT. NGT is a language used by approximately 16,000 deaf and hard-of-hearing people in the Netherlands. It emerged at the end of the 18th century when the first school for deaf children was set up in Groningen. NGT is characterized by a high regional lexical variation: there are five major dialects attributed to the five schools for deaf children. RSL is used by more than 120,000 deaf and hard-of-hearing people in Russia. It emerged at the beginning of the 19th century, when the first school for deaf children was founded in 1806 in Pavlovsk. The choice of RSL and NGT for this study was at least partially pragmatically motivated: for both sign languages, we had access to existing corpora and to native signers. On the other hand, there are theoretical factors that make such a comparison meaningful. Some studies have shown that even comparing two European sign languages can yield interesting results. In addition, since RSL and NGT are unrelated, we can discuss the issue of modality effects. Finally, given certain sociolinguistic differences between RSL and NGT, we can also address their effects on the linguistic properties of the languages.

The first chapter also introduces the main notions of IS. IS is concerned with the signals that the interlocutors give each other in order to control and manage information flow, such as marking given information as such and highlighting new and important information. These two functions are tightly connected to the notions of topic and focus, respectively. We discuss these notions in detail, including the definitions, the typological variation, and some theoretical analyses. It is clear that most languages express focus, and many languages have markers of topics, but that the means of expression and the exact contexts of marking vary a great deal, which makes the descriptive research on RSL and NGT important.

The **second chapter** summarizes previous research on IS in sign languages. We decided to approach IS in RSL and NGT with two goals: to look for markers of the common IS notions of topic and focus, and also to investigate IS-related functions of some typical sign

language constructions previously connected to IS, namely doubling and weak hand holds. Therefore, in the second chapter, we also discuss these four domains as they have been studied for other sign languages.

It is useful to distinguish aboutness and scene-setting topics: the former represent what the sentence is about, while the latter specify the spatial or temporal context of the sentence. Previous studies have shown that different types of topics are marked in a similar way across sign languages: they are often fronted, marked with eyebrow raise, and followed by a prosodic break. Sometimes topics are also marked by a clause-final pronoun co-referent with the topical constituent. Interestingly, many sign languages have been claimed to be topic-prominent, which informally means that the notion of topic is crucial for the structure of sentences. Therefore, we decided to look at the potential markers of aboutness and scene-setting topics in RSL and NGT, and to explore whether these languages can indeed be analyzed as topic-prominent.

Focus is often divided into information (non-contrastive) and contrastive focus; the former expresses new information in general, while the latter is used to overtly contrast alternatives. Sign languages can use fronting and non-manual markers to mark focus, but the most common marker of focus is manual prosody: the articulation of focused signs is usually longer, larger etc. In addition, sign languages use a modality-specific strategy to express contrastive focus, namely contrastive spatial locations and body leans. We decided to describe syntactic, non-manual and manual prosodic markers of information and contrastive focus in RSL and NGT, as well as modality effects in this domain.

Doubling is a process whereby a constituent appears in the sentence twice in different positions (while referring to the same referent/activity/property). It is attested in both signed and spoken languages, but impressionistically, it seems more wide-spread in the visual modality. Producing the same constituent twice is obviously uneconomic; linguists therefore strive to find a motivation for this operation that can overrule economy. For sign languages, different analyses have been proposed, which connect doubling to either focus in general, to emphatic focus, or to other grammatical processes. We therefore analysed formal and functional properties of doubling in RSL and NGT, looking specifically for the relation between doubling and IS. In addition, we addressed the connection between doubling and modality.

Another formal device related to IS is the use of weak hand holds, when one sign is articulated first (by one or both hands) and then one (the strong) hand continues signing while the other (the weak) hand maintains the end state of the first sign. According to some researchers, weak hand holds in different sign languages have IS-related functions, as they mark topical status, high relevance, contrast, or backgrounded information. The forms and functions of weak hand holds in RSL and NGT were therefore studied in order to find out whether they are also related to IS.

Moving on to the specific studies conducted for this thesis, the expression of topics in RSL and NGT is explored in **chapter 3** by analyzing two small corpora: one of RSL, collected specifically for this project, and a part of a larger existing corpus of NGT, selected for this project. The formal markers of aboutness and scene-setting topics proved to be (i) sentence-initial position of the topic, (ii) a prosodic break following the topic, and (iii) non-manual markers, including eyebrow raise and backward head tilt. In NGT and RSL all these markers are used but, in addition, NGT topics are sometimes also marked by a clause-final pointing sign referring back to the topic of the sentence; this last strategy was not evidenced in RSL.

Topics in RSL and NGT are not marked obligatorily. Some potential topics are not marked even prosodically. Our analysis revealed that eyebrow raise and head tilt only mark

shifted topics. In addition, in both RSL and NGT, the VS order is used inthetic sentences. However, this strategy is optional, so the SV order is also accepted inthetic sentences.

According to the criteria of topic prominence commonly applied in the literature, RSL and NGT cannot be considered topic-prominent. Although they both have strategies to mark topics andthetic sentences, this marking was shown to be optional. Other grammatical properties of RSL and NGT also do not justify their classification as topic-prominent languages.

How focus is marked in RSL and NGT is addressed in **chapter 4**. The analysis in this chapter is based on elicited rather than on corpus data. In order to study focus, we collected question-answer pairs based on picture stimuli from 10 RSL and 10 NGT signers. A variety of syntactic and prosodic markers of focus showed up in both languages. In particular, ellipsis of the non-focused part and doubling are the syntactic strategies employed by both languages. Manual prosodic markers such as repetition, modification of the size, speed and length of movement, as well as modification of the height of the sign, are used in both languages, and in both languages they interact with the type of movement of the focused sign. As for non-manual markers, NGT uses eyebrow raise, backward head tilts, head nods and body leans to express focus. In contrast, RSL only uses nods and body leans, and less often than NGT. In addition, both languages use a modality-specific strategy of body leans to express contrast in certain situations.

Another interesting finding concerns the notion of focus projection. For instance, in English, stress on the object can be an expression of either object focus, VP-focus, or focus on the whole sentence. It is reasonable to expect that prosodic manual focus marking in sign languages would behave in a similar way. This is exactly what we found: manual prosodic markers of focus in RSL and NGT project, so that in VP and sentence focus only the verb is usually marked by length, or repetition, etc. Surprisingly, we also found that non-manual markers show focus projection: for instance, in NGT VP focus is marked with eyebrow raise on the object only, while in general, non-manual markers have a tendency to spread across the whole constituent associated with the marker.

In **chapter 5**, we discuss doubling as a potential IS-marker in RSL and NGT. In order to study doubling, we used corpus data, mostly overlapping with the data used in chapter 3. Doubling turned out to be a very prominent phenomenon in both languages. Doubling may result from hesitation and clarification, but at the same time, doubling with the X Y X pattern is a grammatical mechanism regularly used in these languages. RSL and NGT behave similarly with respect to doubling. In general, the same types of constituents can be doubled, but NGT has an additional mechanism of topic doubling which RSL lacks. Moreover, the overall frequency of doubling is very similar for the two languages, but in RSL verbal doubling is much more common, while in NGT clause doubling is prevalent within the X Y X pattern.

It turns out that doubling following the X Y X pattern is used for foregrounding of the doubled constituent (which typically means that some part of the information is marked as more salient than the rest) and for emphasis. Our analysis thus accounts for doubling of different types of constituents, including topic doubling in NGT. In contrast, previous analyses of doubling proposed for other sign languages cannot be directly applied to RSL or NGT. One of the theoretical consequences of the chapter is that in order to account for the data discussed, the inventory of IS notions should include the fore- versus backgrounding distinction, which is orthogonal to the topic/focus distinction.

We also propose a possible path of grammaticalization from repetition of clauses to clause-internal doubling. This path of grammaticalization accounts for the emergence of both formal properties and functions of doubling in RSL and NGT. Although no direct diachronic evidence can be given to support this path of development, the synchronic data support the

hypothesis. Furthermore, we suggest that emphatic doubling might result from foregrounding doubling in RSL and NGT. It is therefore possible to speculate that doubling in other sign languages, as used for emphatic reasons, could have developed via a similar grammaticalization path.

We also address the question why doubling is so wide-spread in sign languages. Among the possible explanations are an analysis of doubling as a compensatory strategy due to the high proportion of non-native signers, and an account that connects doubling to short-term memory limitations in the visual modality. Further typological and theoretical research on doubling in both modalities is necessary to answer this question.

Weak hand holds are analysed in **chapter 6** based on the same data set as used in chapter 3 and some additional NGT data. Both languages turn out to make frequent use of weak hand holds, and the holds have a variety of functions, only some of which are related to IS. These functions can be divided into phonetic (holds due to articulatory reasons), syntactic (holds marking boundaries of syntactic constituents), iconic (holds expressing spatial and temporal relations iconically), and discourse-related (holds expressing information status of referents) functions. Interestingly, the same functions of holds are found in both languages.

Holds in RSL and NGT are, however, quantitatively different: in RSL holds are significantly more frequent than in NGT. There are several possible explanations for this difference in frequency, but they are all hypothetical at this stage of research. The differences in frequency might be connected to different influences of the respective spoken languages, to differences in regional variation, or to differences in co-speech gesture in the respective hearing communities.

Section 6.6 can be considered a sidestep from the main line of research pursued in this dissertation, as it proposes a formal syntactic account of weak hand holds. Within a formal syntactic framework, the rules of linearization, which turn the hierarchically organized syntactic structure into a linear string of words/signs, must be formulated. However, sign languages are challenging in this respect, as they have two partially independent articulators, which also means that they have more options for linearization. Hence, it is crucial to formulate the rules of linearization for sign languages as well, and to compare them to those of spoken languages, in order to pin down the modality effects. It is suggested that the formalism of multidimensional trees, independently proposed for spoken languages, can be applied to weak hand hold constructions, but that additional modality-specific rules of linearization are also required.

In the **concluding chapter**, the results are summarized, typological and theoretical implications of the data are discussed, and modality effects are explored. In particular, we address the questions of how different RSL and NGT are from each other in the domain of IS, and how “normal” they behave from a typological perspective. RSL and NGT data are highly relevant for such theoretical questions as the status of scene-setting topics, the definition of topic prominence, focus projection, focus versus contrast, explanations for the existence of doubling, amongst others. With respect to modality effects in the domain of IS, our investigation reveals that RSL and NGT commonly use strategies that are also attested in spoken languages. However, some modality-specific tools, such as non-manual markers and weak hand holds, are also used. In addition, we point out important parallels between such markers and co-speech gesture.

Finally, further research directions are indicated. In particular, we suggest that the methodology could be improved in order to optimize the reliability of the analysis of corpus and experimental data. In addition, several topics deserve further in-depth research, such as wh-clefts, focus in complex contexts, and dominance reversal. A more systematic comparison of sign languages and co-speech gesture would also be beneficial.

Samenvatting

Dit proefschrift beschrijft de Informatiestructuur (IS) in twee ongerelateerde gebarentalen: Nederlandse Gebarentaal (NGT) en Russische Gebarentaal (Russian Sign Language, RSL). We onderzoeken hoe IS in RSL en NGT tot uitdrukking komt, wat de overeenkomsten en verschillen tussen beide gebarentalen zijn, en we bespreken de verzamelde data binnen een typologisch kader. Daarnaast bespreken en beoordelen we de modaliteitseffecten binnen het domein van IS. Dit onderzoek is een nieuwe bijdrage aan de typologie van gebarentalen omdat de door ons gecontrasteerde gebarentalen tot nog toe nooit vergeleken zijn op hoe ze IS uitdrukken. Dit is bovendien het eerste diepgaande onderzoek naar mogelijke universele en modaliteits-specifieke aspecten in IS-gerelateerde vormen en functies in NGT en RSL. De kwantitatieve en kwalitatieve analyses in dit proefschrift zijn gebaseerd op corpora.

Het **eerste hoofdstuk** van dit proefschrift introduceert de belangrijkste begrippen en onderzoeksvragen. Ten eerste benadrukken wij het belang van het bestuderen van gebarentalen: het gebruik van cross-linguïstische data -inclusief gebarentalen- is onmisbaar om het menselijke taalvermogen te begrijpen, om typologische generalisaties te kunnen maken, en om theoretische modellen te ontwikkelen. Eerder onderzoek naar gebarentalen wordt besproken met daarbij aandacht voor comparatief onderzoek en typologie van gebarentalen. Bovendien bespreken wij het feit dat gebarentalen bestaan binnen de visueel-ruimtelijke modaliteit, hetgeen de grammatica en het gebruik van gebarentalen beïnvloedt in vergelijking met gesproken talen. Mogelijke modaliteitseffecten binnen het IS-domein worden hier geanalyseerd.

Dit hoofdstuk bevat tevens relevante achtergrondinformatie over RSL en NGT. NGT wordt door ongeveer 16.000 doven en slechthorenden in Nederland gebruikt en is ontstaan aan het eind van de 18^{de} eeuw toen de eerste dovenschool werd opgericht in Groningen. NGT wordt gekenmerkt door een hoge mate van regionale lexicale variatie: de vijf dialecten worden toegeschreven aan de vijf dovenscholen. RSL wordt door meer dan 120.000 doven en slechthorenden in Rusland gebruikt en is ontstaan aan het begin van de 19^{de} eeuw toen de eerste dovenschool werd opgericht in Pavlovsk. De keuze om RSL en NGT te vergelijken is deels pragmatisch gemotiveerd: wij hadden toegang tot corpora en gebaarders van beide talen. Niettemin zijn er theoretische factoren die zo'n vergelijking zinvol maken. Onderzoek heeft aangetoond dat een vergelijking tussen twee Europese gebarentalen interessante uitkomsten kan opleveren. Bovendien zijn RSL en NGT niet gerelateerd, waardoor wij de modaliteitseffecten kunnen bespreken. Tenslotte zijn er sociolinguïstische verschillen zijn tussen de door ons bestudeerde gebarentalen, wat het mogelijk maakt om de invloed van deze verschillen op de linguïstische kenmerken van de talen te onderzoeken.

Het eerste hoofdstuk introduceert tevens de belangrijkste begrippen van IS. IS betreft de signalen die sprekers aan elkaar geven om de informatiestroom te controleren en te beheren, zoals het markeren van gegeven informatie en het benadrukken van nieuwe en belangrijke informatie. Deze twee functies zijn verbonden met de begrippen van topic en focus. Wij bespreken deze begrippen inclusief de definities, typologische variatie en theoretische analyses. Het is bekend dat de meeste talen focus kunnen uitdrukken, en dat veel talen topic-markeerders gebruiken. De middelen en de precieze condities van markering verschillen echter aanzienlijk tussen talen waardoor het descriptieve onderzoek naar IS in RSL en NGT belangrijk wordt.

Het **tweede hoofdstuk** is een samenvatting van eerder onderzoek naar IS in gebarentalen. Wij hebben besloten om IS in RSL en NGT vanuit twee perspectieven te bestuderen: we zoeken

naar markeerders van topic en focus, en analyseren ook de mogelijke IS functies van sommige gebarentaal-specifieke constructies die in andere gebarentalen IS-gerelateerd zijn, namelijk verdubbeling (*doubling*) en spreiding van de zwakke hand (*weak hand holds*). Daarom bespreken wij in het tweede hoofdstuk deze vier domeinen (topic, focus, verdubbeling, spreiding) en hoe zij bestudeerd werden in anderen gebarentalen.

Voorts is het zinvol om een onderscheid te maken tussen *aboutness* en *scene-setting* topics: het eerste vertegenwoordigt waar de zin over gaat, en het tweede specificeert de ruimtelijke of temporele context van de zin. Onderzoek heeft aangetoond dat verschillende typen topics in gebarentalen op gelijksoortige manieren gemarkeerd worden: de topics worden naar het begin van de zin verplaatst, gemarkeerd door opgetrokken wenkbrauwen en gevolgd door een prosodische onderbreking. Soms worden topics ook gemarkeerd door een voornaamwoord aan het einde van de zin dat refereert met het topic. Het is interessant dat veel gebarentalen worden beschreven als *topic-prominent*, hetgeen betekent dat het begrip van topic cruciaal is voor de zinsstructuur. Wij hebben daarom besloten de potentiële markeerders van aboutness en scene-setting topics in RSL en NGT te identificeren, en aan de hand daarvan te bestuderen of deze talen topic-prominent zijn.

In focus kan onderscheid worden gemaakt tussen informatieve focus (niet contrastief) en contrastieve focus: het eerste drukt nieuwe informatie in het algemeen uit, en het tweede wordt gebruikt om alternatieven te contrasteren. Gebarentalen gebruiken verplaatsingen en niet-manuele markeerders om focus te markeren. De meest gebruikelijke markeerder van focus is echter manuele prosodie: de articulatie van gebaren in focus wordt groter, langer etc. Bovendien gebruiken gebarentalen een modaliteits-specifieke manier om focus te markeren, zoals contrastieve ruimtelijke lokalisatie en zijwaartse lichaamsbewegingen. Wij hebben besloten om syntactische, niet-manuele, en manuele prosodische markeerders van informatieve en contrastieve focus in RSL en NGT te beschrijven alsmede de modaliteitseffecten binnen het IS-domein.

Een andere markeerder die we aantreffen in IS is verdubbeling. Verdubbeling is een proces waardoor een woordgroep twee keer binnen een zin wordt gebruikt (maar verwijst naar hetzelfde object/activiteit/kenmerk). Verdubbelingen bestaan zowel in gesproken als in gebarentalen, maar lijken gebruikelijker te zijn in de visuele dan in de gesproken modaliteit. Omdat verdubbeling niet economisch is proberen taalwetenschappers een andere motivatie voor dit verschijnsel te vinden. Voor gebarentalen bestaan er verschillende analyses die verdubbeling in verband brengen met focus in het algemeen, met nadrukkelijke (*emphatic*) focus, of met andere grammaticale processen. Om die reden analyseren we de formele en functionele kenmerken van verdubbeling in RSL en NGT, met speciale aandacht voor de relatie tussen verdubbeling en IS. Bovendien bespreken we de verbinding tussen verdubbeling en modaliteit.

Een ander formeel middel dat verband houdt met IS is de spreiding van de zwakke hand, waarbij een gebaar eerst wordt gearticuleerd (met één of beide handen), waarna één hand (de sterke) doorgaat met gebaren, terwijl de andere (zwakke) hand in de eindpositie van het eerste gebaar blijft. Volgens sommige onderzoekers heeft de spreiding van de zwakke hand in verschillende gebarentalen IS-gerelateerde functies, zoals markering van topics, hoge relevantie, contrast of achtergrondinformatie. De vormen en functies van spreidingen in RSL en NGT worden dus bestudeerd om te achterhalen of ze verbonden zijn met IS.

Het **derde hoofdstuk** onderzoekt topics in RSL en NGT aan de hand van twee corpora: het RSL corpus dat speciaal verzameld is voor dit project, en het NGT corpus dat geselecteerd is uit een groter reeds bestaand corpus.

De formele markeerders van topics in RSL en NGT zijn (i) een zinsinitiële positie, (ii) een prosodische onderbreking na de topic, en (iii) niet-manuele markeerders, inclusief het optrekken van wenkbrauwen en het naar achter buigen van het hoofd. Deze markeerders

worden gebruikt in beide talen. In NGT worden topics bovendien soms gemarkeerd door een voornaamwoord aan het einde van de zin dat refereert met de topic; deze strategie werd niet gevonden in RSL.

Topics worden in RSL en NGT niet verplicht gemarkeerd. Sommige potentiële topics worden zelfs niet prosodisch gemarkeerd. Verder worden de niet-manuele markeerders alleen met *shifted* topics gebruikt. Bovendien wordt de VS-woordvolgorde gebruikt in thetische zinnen. Niettemin is deze strategie ook niet verplicht aangezien de SV-woordvolgorde in thetische zinnen ook acceptabel is.

Gebaseerd op de criteria van topic prominence die vaak gebruikt worden in de literatuur zijn RSL en NGT niet topic-prominent. Hoewel de talen over strategieën beschikken om topics en thetische zinnen te markeren, zijn de markeerders optioneel. Tevens zorgen andere grammaticale kenmerken van RSL en NGT ervoor dat deze talen zich niet als topic-prominent laten karakteriseren.

In het **vierde hoofdstuk** beschrijven we hoe focus gemarkeerd wordt in RSL en NGT. De analyse in dit hoofdstuk is gebaseerd op experimentele data en niet op een corpus. Om focus te bestuderen hebben we vraag-antwoord paren verzameld, gebaseerd op plaatjes van 10 NGT gebaarders en 10 RSL gebaarders. Wij hebben verschillende syntactische en prosodische markeerders van focus in beide talen gevonden. Ellipsis van gebaren die niet in focus zijn, en verdubbeling worden bijvoorbeeld gebruikt om focus te markeren. Verder worden manuele prosodische markeerders gebruikt, zoals herhaling, modificatie van grootte, snelheid, en lengte van de beweging, en modificatie van de hoogte van het gebaar. Deze markeerders zijn in interactie met het type van beweging van het gebaar. Niet-manuele markeerders van focus zoals het optrekken van wenkbrauwen, het naar achter buigen van het hoofd, knikken met het hoofd, en andere lichaamsbewegingen worden in NGT gebruikt. RSL gebruikt echter alleen het hoofdknikken en lichaamsbewegingen, in mindere mate dan NGT. Bovendien gebruiken beide talen een modaliteits-specifieke strategie om contrast te markeren.

Een ander interessant resultaat betreft het begrip focusprojectie (*focus projection*). In het Engels kan bijvoorbeeld het accent op het object een markeerder zijn van focus op het object, van VP-focus, of van focus op de hele zin. Het is te verwachten dat de manuele prosodische markering van focus in gebarentalen op dezelfde manier zal werken. Wat wij hebben gevonden is in lijn met die verwachting: manuele prosodische markeerders van focus in RSL en NGT projecteren, zodat de VP en zinsfocus worden gemarkeerd door prosodische markering van het werkwoord. Verrassend genoeg hebben wij focusprojectie ook voor niet-manuele markeerders gevonden: zo wordt VP-focus in NGT alleen op het object gemarkeerd door het omhoog trekken van wenkbrauwen, hoewel de niet-manuele markeerders in het algemeen een sterke neiging hebben om te spreiden door meerdere zinsdelen.

In het **vijfde hoofdstuk** bespreken we verdubbeling als een potentiële IS-markeerder in RSL en NGT. Om verdubbeling te bestuderen hebben we corpusdata gebruikt die grotendeels overlapt met de data uit het derde hoofdstuk. Verdubbeling bleek heel gebruikelijk te zijn in beide gebarentalen. Het kan een gevolg zijn van aarzeling of gebruikt worden voor verduidelijking, maar verdubbeling volgens een X Y X patroon is een grammaticaal middel dat regelmatig in beide talen wordt gebruikt. In principe kunnen dezelfde soorten woordgroepen worden verdubbeld in beide talen, NGT beschikt daarnaast over een apart mechanisme van topic dat RSL niet heeft. De algemene frequentie van verdubbeling is bijna gelijk in de twee talen. In RSL is verdubbeling van werkwoorden echter gebruikelijker, terwijl in NGT verdubbeling van zinnen overheersend is.

Het blijkt dat verdubbeling volgens het X Y X patroon wordt gebruikt om *foregrounding* van het verdubbelde gebaar uit de drukken (dat betekent meestal dat een deel van de nieuwe informatie is gemarkeerd als meer betekenisvol) of voor nadruk (*emphasis*). Onze analyse kan de verdubbeling van verschillende soorten woordgroepen verklaren, inclusief

topic-verdubbeling in NGT. Eerdere analyses van verdubbeling in andere talen zijn niet toe te passen op de RSL- en NGT-data. Eén van de theoretische conclusies van dit hoofdstuk is dat we naast topic en focus extra IS-gerelateerde begrippen nodig hebben om de data te verklaren: er moet een onderscheid gemaakt worden tussen foregrounding vs. backgrounding.

Wij stellen een mogelijk grammaticalisatiepad voor, waardoor verdubbeling van woordgroepen binnen een zin voortkomt vanuit verdubbeling van zinnen. Dit grammaticalisatiepad verklaart het ontstaan van formele en functionele kenmerken van verdubbeling in RSL en NGT. Hoewel het niet mogelijk is om direct diachronisch bewijs te vinden voor deze ontwikkeling, is de synchronische data compatibel met deze hypothese. Daarnaast suggereren wij dat emphatische verdubbeling een verdere ontwikkeling kan zijn van verdubbeling door foregrounding. Het is dus aannemelijk om te veronderstellen dat verdubbeling gebruikt voor nadruk, zich ook in andere gebarentalen via een gelijksoortig grammaticalisatiepad ontwikkeld heeft.

Wij bespreken daarnaast de vraag waarom verdubbeling zo vaak voorkomt in gebarentalen. Binnen sommige verklaringen wordt verdubbeling geanalyseerd als een compensatiestrategie van niet-moedertaalgebruikers, die een groot aandeel vormen binnen het totale aantal gebaarders. Andere verklaringen leggen een verband tussen verdubbeling en beperkingen in het visuele kortetermijngeheugen. Verder typologisch en theoretisch onderzoek naar verdubbeling in beide modaliteiten is nodig om deze vraag te beantwoorden.

De spreiding van de zwakke hand wordt in het **zesde hoofdstuk** geanalyseerd op basis van dezelfde data als in hoofdstuk 3, met toevoeging van extra NGT data. Zowel NGT als RSL gebruiken deze spreiding vaak, en de spreiding heeft verschillende functies waarvan slechts enkele IS-gerelateerd zijn. Deze functies kunnen worden verdeeld in vier categorieën: fonetische functies ('de spreiding heeft een articulatoirische oorzaak), syntactische functies (de spreiding markeert de grenzen van syntactische entiteiten), iconische functies (de spreiding geeft ruimtelijke en temporele relaties op een iconische wijze weer), en functies gerelateerd aan discourse (de spreiding drukt de informatiestatus van referenten uit). Het is interessant dat dezelfde functies aanwezig zijn in beide talen.

Niettemin zijn er kwantitatieve verschillen tussen RSL en NGT wat betreft de spreiding van de zwakke hand: het komt significant vaker voor in RSL dan in NGT. Er zijn meerdere mogelijke verklaringen voor dit verschil. Het verschil in kwantiteit kan te maken hebben met verschillende invloeden van de desbetreffende gesproken talen, verschillen in regionale variatie, of verschillen in de gesticulatie van de desbetreffende horende gemeenschappen.

Paragraaf 6.6 kan beschouwd worden als een afwijking van de hoofdlijn van dit proefschrift, omdat het een formele syntactische analyse van de spreiding van de zwakke hand bevat. Binnen een formeel syntactisch framework moet men de regels van linearizatie (*linearization*) formuleren die nodig zijn om de hiërarchische syntactische structuur te veranderen in een lineaire rij van woorden/gebaren. Gebarentalen zijn echter zeer uitdagend wat betreft linearizatie, omdat ze over twee deels onafhankelijke articulatoren beschikken, en er dus meer mogelijkheden zijn voor linearizatie dan voor gesproken talen het geval is. Daarom is het noodzakelijk om de regels van linearizatie voor gebarentalen te formuleren om vervolgens de mogelijke modaliteitseffecten te kunnen achterhalen. Wij suggereren dat het formalisme van multidimensionale bomen, hetgeen onafhankelijk ontwikkeld is voor een aantal gesproken talen, kan worden toegepast om de spreiding van de zwakke hand te beschrijven, maar dat de regels van linearizatie modaliteits-specifiek moeten zijn.

In het **laatste hoofdstuk** worden de resultaten samengevat en worden typologische en theoretische implicaties van de data en de modaliteitseffecten besproken. We bespreken hoe verschillend RSL en NGT zijn op het gebied van IS en hoe “normaal” ze zijn vanuit een typologische invalshoek. De RSL- en NGT-data zijn heel relevant voor het beantwoorden van theoretische vragen omtrent de status van scene-setting topics, de definitie van topic

prominence, focusprojectie, focus vs. contrast en verklaringen voor verdubbeling. Wat betreft de modaliteitseffecten in het domein van IS hebben we gevonden dat RSL en NGT vaak strategieën gebruiken die ook in gesproken talen voorkomen. Daarnaast wordt er een aantal modaliteits-specifieke middelen, zoals niet-manuele markeerders en de spreiding van de zwakke hand, gebruikt. Bovendien bespreken wij de belangrijke parallellen tussen zulke markeerders en gesticulatie.

Tenslotte worden ideeën voor verder onderzoek geformuleerd. Wij suggereren dat de methodologie verbeterd kan worden om de betrouwbaarheid van de corpusanalyses en van experimentele data te optimaliseren. Bovendien vragen enkele onderwerpen, zoals *wh-clefts*, focus in complexe contexten en *dominance reversal* om verder diepgaand onderzoek. Een meer systematische vergelijking tussen gebarentalen en gesticulatie zou ook wenselijk zijn.

Краткое содержание

В этой диссертации рассматривается информационная структура (ИС) в двух неродственных жестовых языках: русском жестовом языке (РЖЯ) и нидерландском жестовом языке (НЖЯ). Мы описываем выражение ИС в РЖЯ и НЖЯ, исследуем сходства и различия между двумя языками, и обсуждаем данные с типологической точки зрения; наконец, мы оцениваем эффекты модальности в этой области.

Эта диссертация вносит вклад в типологию жестовых языков, так как эти два языка не сравнивались ранее с точки зрения ИС. В ней впервые предпринимается изучение форм и функций, связанных с ИС в этих жестовых языках, в поисках возможных универсалий и аспектов, определяемых модальностью. Наконец, в ней анализируются корпусные и экспериментальные данные с количественной и качественной точки зрения.

В **первой главе** диссертации мы даём основные определения и формулируем вопросы. Во-первых, мы подчёркиваем важность изучения жестовых языков, так как, чтобы понять человеческую способность к изучению языка, делать типологические обобщения, и строить теоретические модели языка, необходимы данные разных языков, включая жестовые. Также в этой главе обсуждаются предыдущие исследования жестовых языков, особенно сравнительные и типологические. Кроме того, обсуждается тот факт, что жестовые языки существуют в визуально-пространственной модальности, что может повлиять на их грамматику и использование, и привести к различиям со звуковыми языками. Поэтому мы рассмотрим эффекты модальности и в области ИС.

Во-вторых, в этой главе содержится необходимая базовая информация о РЖЯ и НЖЯ. НЖЯ – это язык, который используют примерно 16 000 глухих и слабослышащих людей на территории Нидерландов. Он возник в конце 18 века, когда в Гронингене была основана первая школа для глухих детей. Он характеризуется высокой степенью региональной лексической вариативности: существует пять основных диалектов НЖЯ, которые связывают с пятью школами для глухих детей. РЖЯ используется как минимум 120 000 глухих и слабослышащих на территории России. Он возник в начале 19 века, когда в Павловске была открыта первая школа для глухих детей. Выбор РЖЯ и НЖЯ в качестве объекта исследования был частично мотивирован прагматическими соображениями: у нас был доступ к корпусам и носителям языков. С другой стороны, с теоретической точки зрения такое сравнение тоже интересно. Предыдущие исследования показали, что даже сравнение европейских жестовых языков приносит важные результаты. Кроме того, РЖЯ и НЖЯ не родственные, что позволяет с их помощью изучать эффекты модальности. Наконец, РЖЯ и НЖЯ различаются социолингвистически, что позволяет также изучить последствия этих различий для грамматики.

В первой главе также даются определения основных понятий ИС. ИС изучает сигналы, которые собеседники подают друг другу, для того чтобы контролировать поток информации, например, помечая часть информации как данное, или подчёркивая новую и важную информацию. Эти две функции связаны с понятиями топика и фокуса соответственно. Мы даём подробные определения этим понятиям, а также обсуждаем их с типологической и теоретической точек зрения. Ясно, что почти все языки могут выражать фокус, и многие также маркируют топик, однако средства выражения в разных языках различаются, что делает описание и сравнение РЖЯ и НЖЯ важным.

Во **второй главе** мы кратко пересказываем результаты предыдущих исследований ИС в жестовых языках. Мы решили описывать ИС в РЖЯ и НЖЯ с двух сторон: во-первых, мы описываем то, как выражаются топик и фокус, а во-вторых, мы исследуем функции некоторых специфично жестовых конструкций, которые связаны с ИС в других жестовых языках, а именно удвоение (*doubling*) и удержания пассивной руки (*weak hand holds*). Поэтому во второй главе мы обсуждаем эти четыре темы на материале прошлых исследований жестовых языков.

Исследования показали, что имеет смысл различать понятия *aboutness topic* и *scene-setting topic*: первое определяется как то, о чём идёт речь в предложении, а второе – как указание времени и места ситуации, описываемой в предложении. Оказалось, что разные жестовые языки используют схожие маркеры для топиков разных типов, а именно топик обычно находится в начале предложения, маркируется поднятыми бровями, и отделяется от остальной части предложения просодической границей. Иногда топик также маркируется местоимением в конце предложения, кореферентным топику. Интересно, что многие жестовые языки характеризуются как топиковые (*topic prominent*), то есть топик в них играет важнейшую роль в структуре предложения. Поэтому мы решили рассматривать потенциальные маркеры топиков обоих видов в РЖЯ и НЖЯ, а также обсудить вопрос о том, являются ли эти языки топиковыми.

Фокус часто разделяют на информационный и контрастивный: первый выражает новую информацию в целом, а второй используется для того, чтобы прямо противопоставить альтернативы друг другу. Жестовые языки часто используют передвижение в начало предложения, а также немануальные маркеры, чтобы обозначить фокус, но основным маркером фокуса является мануальная просодия: жесты в фокусе обычно длиннее, больше по амплитуде и т.д. Кроме того, жестовые языки используют специфичную для визуальной модальности стратегию маркирования контраста при помощи контрастивной локализации и наклонов тела. Поэтому мы решили описать синтаксические, немануальные, и мануальные маркеры информационного и контрастивного фокуса в РЖЯ и НЖЯ, а также эффекты модальности в этой области.

Удвоение – это явление, в результате которого составляющая появляется в предложении больше одного раза, при этом относясь к одному и тому же референту или действию. Это явление существует и в звуковых, и в жестовых языках, однако в жестовых языках оно, как кажется, более широко распространено. Произносить составляющую дважды очевидно неэкономно, поэтому лингвисты стараются найти мотивацию для удвоения, из-за которой экономия становится менее важна. В жестовых языках функции удвоения обычно связывают с фокусом в целом, с эмфатическим фокусом, или с другими грамматическими процессами. Поэтому мы решили анализировать формальные свойства и значение удвоения в РЖЯ и НЖЯ, уделяя особое внимание ИС. Кроме того, мы обсудили связь удвоения с модальностью.

Другой конструкцией, связанной с ИС в жестовых языках, являются удержания пассивной руки, когда сначала выполняется один жест (одной или двумя руками), а затем одна рука (активная) продолжает выполнять жесты, в то время как другая (пассивная) удерживается в конечном положении первого жеста. Согласно некоторым исследователям, удержания пассивной руки в разных жестовых языках имеют функции, связанные с ИС, а именно они маркируют топикальность, высокую степень важности, контраст, или фоновую информацию. Поэтому мы изучили формы и функции удержаний в РЖЯ и НЖЯ, чтобы выяснить их связь с ИС.

Переходя непосредственно к теме этой диссертации, в **третьей главе** мы описываем выражение топика в РЖЯ и НЖЯ на основе небольших корпусов: корпуса РЖЯ, собранного специально для данного проекта, и корпус НЖЯ, который был

составлен из текстов большого корпуса, собранного ранее другими исследователями. Оказалось, что топики обоих видов в РЖЯ и НЖЯ маркируются (1) начальной позицией в предложении, (2) просодической границей после топика, и (3) немануальными маркерами, а именно поднятием бровей и наклоном головы назад. Кроме того, в НЖЯ топик также может маркироваться местоимением в конце предложения, кореферентным с топиком, в то время как в РЖЯ такая стратегия не засвидетельствована.

Топики в РЖЯ и НЖЯ маркируются не обязательно. Некоторые потенциальные топики не маркируются даже просодически. Наш анализ показал, что немануальные маркеры используются только при смене топика. Помимо маркирования топика, в РЖЯ и НЖЯ также есть особая стратегия маркирования тетических предложений, а именно порядок слов VS. Эта стратегия тоже опциональна, так как порядок SV в тетических предложениях тоже возможен.

Согласно критериям топиковости языков, которые часто используются в литературе, РЖЯ и НЖЯ не являются топиковыми. В этих языках есть средства маркирования топика, а также тетических предложений, но использование их является необязательным. Другие грамматические свойства РЖЯ и НЖЯ также не позволяют назвать их топиковыми.

В **четвёртой главе** мы обсуждаем, как в РЖЯ и НЖЯ маркируется фокус. В этой главе анализируются данные, полученные путём эlicitации. Мы собрали пары вопросов и ответов, основанные на стимулах-картинках, произнесённые 10 носителями РЖЯ и 10 носителями НЖЯ. Мы выяснили, что фокус маркируется синтаксически и просодически в обоих языках. Так, синтаксическими маркерами фокуса являются эллипсис нефокусной части предложения, а также удвоение. Мануальными маркерами фокуса являются повторение, а также модификация движения (удлинение, увеличение размера, замедление) и модификация высоты жеста. Что касается немануальных маркеров, в НЖЯ топик маркируется поднятием бровей, движением головы назад, кивками, и наклонами тела. В РЖЯ же используются лишь кивки и наклоны тела, и менее часто, чем в НЖЯ. Кроме того, оба языка используют специфичную для визуальной модальности стратегию наклонов тела для выражения контраста.

Другое интересное наблюдение касается понятия фокусной проекции (*focus projection*). Например, в английском языке фразовое ударение на объекте может маркировать как фокус на объекте, так и фокус на глагольной группе или на всём предложении. Разумно ожидать, что такое же явление можно будет наблюдать на примере мануальных просодических маркеров фокуса в жестовых языках. Так и оказалось: в РЖЯ и НЖЯ в контексте фокуса на глагольной группе или на всём предложении обычно просодически маркируется только глагол. Более удивительным является тот факт, что фокусная проекция наблюдается и у немануальных маркеров. Так, в НЖЯ фокус на глагольную группу маркируется поднятием бровей лишь на объекте, при том что другие немануальные маркеры обычно распространяются, то есть выполняются одновременно со всей составляющей, к которой относятся.

В **пятой главе** мы обсуждаем удвоение как потенциальный маркер ИС в РЖЯ и НЖЯ. Удвоение мы изучали на основе корпусных данных, по большей части тех же, что использовались в третьей главе. Удвоение активно используется в обоих языках. Оно может быть результатом хезитации, или использоваться для пояснения, но удвоение по модели X Y X является регулярно используемым грамматическим механизмом. РЖЯ и НЖЯ используют удвоение схожим образом: одни и те же составляющие могут удваиваться в обоих языках, за исключением удвоения топика, которое присутствует только в НЖЯ. Удвоение одинаково частотно в РЖЯ и НЖЯ, но в РЖЯ основным типом является удвоение глагола, а в НЖЯ – удвоение клаузы.

Мы выяснили, что основной функцией удвоения по модели X Y X является вынесение на передний план (*foregrounding*), то есть какая-то часть информации маркируется как более важная, чем остальная информация; другой функцией является эмпфаза. Наш анализ позволяет объяснить удвоение различных составляющих, включая удвоение топиков в НЖЯ. Напротив, предыдущие анализы удвоения в других жестовых языках неприменимы к данным РЖЯ и НЖЯ. Одним из теоретических последствий этой главы является то, что становится необходимым понятие вынесения на передний план, в дополнение к описанным выше понятиям, топика и фокуса.

Мы также предлагаем возможный путь грамматикализации из повторения предложений в удвоение внутри предложения. Этот путь грамматикализации объясняет возникновение формальных и функциональных свойств удвоения в РЖЯ и НЖЯ. Хотя прямых диахронических доказательств этого пути развития не существует, синхронные данные согласуются в этой гипотезой. Кроме того, мы предполагаем, что эмпфатическое удвоение может быть следующей ступенью развития удвоения с функцией вынесения на передний план. Таким образом, можно представить, что удвоение в других жестовых языках, которое используется для эмпфазы, развилось схожим образом.

Мы также обсуждаем вопрос о том, почему удвоение так широко распространено в жестовых языках. Возможные объяснения включают в себя анализ удвоения как компенсационной стратегии, связанной с высоким процентом неносителей, а также связь между удвоением и ограничениями кратковременной памяти в визуальной модальности. Дальнейшие типологические и теоретические исследования звуковых и жестовых языков необходимы, чтобы ответить на этот вопрос.

В **шестой главе** мы обсуждаем удержания пассивной руки в РЖЯ и НЖЯ, на основе корпусов, использованных также в третьей главе, и нескольких дополнительных текстов на НЖЯ. Оба языка используют удержания довольно часто, и удержания имеют различные функции, лишь некоторые из которых связаны с ИС. Эти функции можно разделить на фонетические (удержание происходит по артикуляционным причинам), синтаксические (удержания маркируют синтаксические составляющие), иконические (удержания иконически выражают пространственные и временные отношения), и дискурсивные (удержания выражают информационный статус референтов). Что интересно, в РЖЯ и НЖЯ удержания имеют один и тот же набор функций.

С количественной точки зрения, тем не менее, удержания в РЖЯ и НЖЯ различаются: в РЖЯ они значительно более частотны. Мы обсуждаем несколько возможных объяснений этому различию, который на данный момент являются гипотетическими. К этим объяснениям относятся разное влияние звуковых языков, разница в региональной вариативности, или разница в жестикуляции слышащих.

Секция 6.6 является отклонением от основного курса данной диссертации, так как в ней предлагается формальный синтаксический анализ удержаний. В рамках формальной теории необходимо сформулировать правила линеаризации: процесса, в ходе которого иерархически устроенная синтаксическая структура преобразуется в линейный ряд слов или жестов. Жестовые языки ещё более сложны с этой точки зрения, так как они используют два частично независимых артикулятора (две руки), так что возможностей для линеаризации становится больше. Поэтому необходимо сформулировать правила линеаризации и для жестовых языков, и сравнить их с линеаризацией в звучащих языках, для того чтобы найти возможные эффекты модальности. Мы предположили, что формализм многомерных деревьев, который был разработан на материале звуковых языков, может применяться к анализу удержаний в РЖЯ и НЖЯ, но что правила линеаризации должны быть сформулированы по-другому, в терминах, специфичных для визуальной модальности.

В **последней главе** мы кратко формулируем результаты исследования, а также обсуждаем теоретические и типологические последствия и эффекты модальности. В частности, мы обсуждаем, насколько РЖЯ и НЖЯ различаются в области ИС, и насколько они «нормальны» с точки зрения типологии. Данные РЖЯ и НЖЯ важны для таких теоретических вопросов, как статус топиков, определение топикальных языков, фокусная проекция, фокус и контраст, объяснения существования удвоения, и других. С точки зрения эффектов модальности в области ИС наше исследование показало, что РЖЯ и НЖЯ чаще всего используют стратегии, которые также присутствуют в звуковых языках. Тем не менее, некоторые специфичные для визуальной модальности средства, такие как немануальные маркеры и удержания пассивной руки, тоже используются. Кроме того, мы указываем на важные параллели между этими средствами и жестикуляцией, сопровождающей речь в звуковых языках.

Наконец, мы обсуждаем возможные направления дальнейших исследований. В частности, мы предполагаем, что методология может быть улучшена с целью увеличения надёжности анализа корпусных и экспериментальных данных. Кроме того, мы перечисляем темы, заслуживающие серьёзных исследований, такие как клефты, маркирование фокуса в сложных контекстах, и смена доминантности (*dominance reversal*). Более систематическое сравнение жестовых языков и жестикуляции слышащих также кажется нам перспективной областью.