

Modality and structure in signed and spoken languages

The realization that signed languages are true languages is one of the great discoveries of the last thirty years of linguistic research. The work of many sign language researchers has revealed deep similarities between signed and spoken languages in their structure, acquisition, and processing, as well as differences arising from the differing articulatory and perceptual constraints under which signed languages are used and learned. This book provides a crosslinguistic examination of the properties of many signed languages, including detailed case studies of American, Hong Kong, British, Mexican, and German Sign Languages. The contributions to this volume, by some of the most prominent researchers in the field, focus on a single question: to what extent is linguistic structure influenced by the modality of language? Their answers offer particular insights into the factors that shape the nature of language and contribute to our understanding of why languages are organized as they are.

RICHARD P. MEIER is Professor of Linguistics and Psychology at the University of Texas at Austin. His publications have appeared in various journals including Language, Cognitive Psychology, Journal of Memory and Language, Applied Psycholinguistics, Phonetica, and American Scientist.

KEARSY CORMIER is a lecturer of Deaf Studies in the Centre for Deaf Studies at the University of Bristol. She earned her doctorate in linguistics at the University of Texas at Austin. Her dissertation explores phonetic properties of verb agreement in American Sign Language.

DAVID QUINTO-POZOS received his doctorate in linguistics from the University of Texas at Austin. He currently teaches in the Department of Linguistics at the University of Pittsburgh.



Modality and structure in signed and spoken languages

edited by

Richard P. Meier, Kearsy Cormier, and David Quinto-Pozos

with the assistance of Adrianne Cheek, Heather Knapp, and Christian Rathmann





PUBLISHED BY THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE The Pitt Building, Trumpington Street, Cambridge, United Kingdom

CAMBRIDGE UNIVERSITY PRESS
The Edinburgh Building, Cambridge CB2 2RU, UK
40 West 20th Street, New York, NY 10011-4211, USA
477 Williamstown Road, Port Melbourne, VIC 3207, Australia
Ruiz de Alarcón 13, 28014 Madrid, Spain
Dock House, The Waterfront, Cape Town 8001, South Africa

http://www.cambridge.org

© Cambridge University Press 2002

This book is in copyright. Subject to statutory exception and to the provisions of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press.

First published 2002

Printed in the United Kingdom at the University Press, Cambridge

Typeface Times 10/12 pt System \LaTeX 2 ε [TB]

A catalogue record for this book is available from the British Library

ISBN 0 521 80385 3 hardback



Contents

	of figures	page viii
	of tables	xi
	of contributors	xiii
Ackı	Acknowledgments	
1	Why different, why the same? Explaining effects and non-effects of modality upon linguistic structure in sign and speech RICHARD P. MEIER	1
Par	t I Phonological structure in signed languages	27
2	Modality differences in sign language phonology and morphophonemics DIANE BRENTARI	35
3	Beads on a string? Representations of repetition in spoken and signed languages RACHEL CHANNON	65
4	Psycholinguistic investigations of phonological structure in ASL DAVID P. CORINA AND URSULA C. HILDEBRANDT	88
5	Modality-dependent aspects of sign language production: Evidence from slips of the hands and their repairs in German Sign Language ANNETTE HOHENBERGER, DANIELA HAPP, AND HELEN LEUNINGER	112
6	The role of Manually Coded English in language development of deaf children SAMUEL J. SUPALLA AND CECILE MCKEE	143

V



vi Contents

Par	t II Gesture and iconicity in sign and speech	167
7	A modality-free notion of gesture and how it can help us with the morpheme vs. gesture question in sign language linguistics (Or at least give us some criteria to work with) ARIKA OKRENT	175
8	Gesture as the substrate in the process of ASL grammaticization TERRY JANZEN AND BARBARA SHAFFER	199
9	A crosslinguistic examination of the lexicons of four signed languages ANNE-MARIE P. GUERRA CURRIE, RICHARD P. MEIER, AND KEITH WALTERS	224
Par	t III Syntax in sign: Few or no effects of modality	237
10	Where are all the modality effects? DIANE LILLO-MARTIN	241
11	Applying morphosyntactic and phonological readjustment rules in natural language negation ROLAND PFAU	263
12	Nominal expressions in Hong Kong Sign Language: Does modality make a difference? GLADYS TANG AND FELIX Y. B. SZE	296
	t IV Using space and describing space: Pronouns, classifiers, verb agreement	321
13	Pronominal reference in signed and spoken language: Are grammatical categories modality-dependent? SUSAN LLOYD MCBURNEY	329
14	Is verb agreement the same crossmodally? CHRISTIAN RATHMANN AND GAURAV MATHUR	370
15	The effects of modality on spatial language: How signers and speakers talk about space KAREN EMMOREY	405



	Contents	vii
16	The effects of modality on BSL development in an exceptional learner GARY MORGAN, NEIL SMITH, IANTHI TSIMPLI, AND BENCIE WOLL	422
17	Deictic points in the visual–gestural and tactile–gestural modalities DAVID QUINTO-POZOS	442
Inde	ex	469



Figures

2.1	2.1a The handshape parameter used as an articulator in THINK; 2.1b as a place of articulation in TOUCH;	
	2.1c as a movement in UNDERSTAND	page 41
2.2	ASL signs showing different timing patterns of handshape	1 - 6
	and path movement	42
2.3	Nominalization via reduplication	49
2.4	Nominalization via trilled movement affixation	50
2.5	2.5a UNDERSTAND (simple movement sign);	
	2.5b ACCOMPLISH-EASILY (complex movement sign)	53
2.6	Polymorphemic form	58
2.7	2.7a Handshape used in AIRPLANE with a thumb	
	specification; 2.7b Handshape used in MOCK with no thumb	
	specification	59
4.1	Reaction times for the two versions of the experiment	90
4.2	Reaction times for detection of handshapes in ASL signs	96
4.3	Word–picture interference and facilitation	99
4.4	Comparisons of sign-picture and word-picture	
	interference effects	101
4.5	Results from Experiment 1: Two-shared parameter condition	105
4.6	Results from Experiment 2: Single parameter condition	106
5.1	Levelt's (1989: 9) model of language production	116
5.2	Picture story of the elicitation task	118
5.3	5.3a SEINE [Y-hand]; 5.3b ELTERN [Y-hand]; 5.3c correct:	
	SEINE [B-hand]	119
5.4	5.4a substitution: VA(TER); 5.4b conduite: SOHN;	
	5.4c target/correction: BUB	122
5.5	5.5a VATER [B-hand]; 5.5b slip: MOTHER [B-hand];	
	5.5c correct: MOTHER [G-hand]	123
5.6	5.6a MANN [forehead]; 5.6b slip: FRAU [forehead];	
	5.6c correct: FRAU [breast]	124
5.7	5.7a slip: HEIRAT/HOCHZEIT; 5.7b correction: HEIRAT;	
	5.7c correct: HOCHZEIT	126

viii



	List of figures	ix
5.8	A polymorphemic form in ASL (Brentari 1998:21)	130
6.1	6.1a The SEE 2 sign -ING; 6.1b The SEE 2 sign -MENT	149
6.2	The SEE 2 sign -S	150
6.3	Three forms of the ASL sign IMPROVE: 6.3a the citation	
	form; 6.3b the form inflected for continuative aspect;	
	6.3c a derived noun	152
6.4	The SEE 2 signs: 6.4a IMPROVING; 6.4b IMPROVEMENT	153
6.5	The SEE 2 sign KNOWING: 6.5a prior to assimilation;	
	6.5b after assimilation	155
7.1	Video stills of speaker telling the story of a cartoon he has	
	just watched	181
7.2	Illustration of (2)	183
7.3	Illustration of (3)	184
7.4	Spectrogram of English utterance with gestural intonation	192
7.5	Spectrogram of Chinese utterance with neutral intonation	193
7.6	Spectrogram of Chinese utterance with gestural intonation	194
8.1	8.1a 1855 LSF PARTIR ('to leave'); 8.1b 1855 LSF FUTUR	
	('future') (Brouland 1855); 8.1c 1913 ASL FUTURE	
	(McGregor, in 1997 Sign Media Inc.); 8.1d Modern ASL	
	FUTURE (Humphries et al. 1980)	204
8.2	On se tire ('go') (Wylie 1977)	206
8.3	8.3a 1855 LSF POUVOIR (Brouland 1855); 8.3b 1913 ASL	
	CAN (Hotchkiss in 1997 Sign Media Inc.); 8.3c Modern	
	ASL CAN (Humphries et al. 1980)	209
8.4	8.4a 1855 LSF IL-FAUT ('it is necessary') (Brouland 1855);	
	8.4b 1913 ASL OWE (Hotchkiss in 1997 Sign Media Inc.);	
	8.4c Modern ASL MUST (Humphries et al. 1980)	211
9.1	Decision tree for classification of sign tokens in corpus	227
10.1	ASL verb agreement: 10.1a 'I ask her'; 10.1b 'He asks me'	246
10.2	Verb agreement template (after Sandler 1989)	247
11.1	Five-level conception of grammar	265
12.1	INDEX _{det i}	298
12.2	'That man eats rice'	299
12.3	'Those men are reading'	300
12.4	12.4a ONE _{det/num} ; 12.4b ONE _{num}	301
12.5	'A female stole a dog'	302
12.6	12.6a-b ONE _{det-path} ; 12.6c PERSON	304
12.7	12.7a POSS _{det i} ; 12.7b POSS _{neu}	306
12.8	'That dog is his'	307
13.1	ASL signing space as used for pronominal reference	334
13.2	Continuum of referential specificity	345
14.1	ASK 'You ask me' in ASL	374



X	List of figures	
14.2	'You ask me' in DGS, NS, and Auslan	375
14.3	An adaptation of Jackendoff's (1992) model	387
14.4	Making the conceptualization of referents visible	389
14.5	Affixation in spoken languages	394
14.6	Readjustment in signed languages	395
15.1	Illustration of ASL descriptions of the location of a table	
	within a room	406
15.2	Illustration of a speaker: 15.2a Using shared space;	
	15.2b Using the addressee's spatial viewpoint to indicate the	
	location of the box marked with an "X"	408
15.3	Map of the town (from Tversky and Taylor 1992)	413
15.4	Illustration: 15.4a of reversed space; 15.4b of mirrored	
	space; 15.4c of two examples of the use of shared space for	
	non-present referents	415
16.1	Assessments of comprehension across BSL grammar tests:	
	Christopher and mean comparator scores	432
16.2	'(He) asks (her)'	433
16.3	*'I like (her)'	434
17.1	Total use of indexation by each subject	455



Tables

1.1	Non-effects of modality: Some shared properties between	
	signed and spoken languages	page 2
1.2	Possible sources of modality effects on linguistic structure	ϵ
1.3	Some properties of the articulators	7
1.4	Some properties of the sensory and perceptual systems	
	subserving sign vs. speech	10
1.5	Possible outcomes of studies of modality effects	13
2.1	Differences between vision and audition	37
2.2	Traditional "parameters" in sign language phonological	
	structure and one representative feature	38
2.3	Canonical word shape according to the number of syllables	
	and morphemes per word	57
3.1	Words: Irregular and rhythmic repetition as percentages of	
	all repetition	70
3.2	Signs: Irregular and rhythmic repetition as percentages of	
	all repetition	71
4.1	Instruction to subjects: "Press the button when you see a	
	'l' handshape"	95
5.1	DGS slip categories, cross-classified with affected entity	120
5.2	Frequency of phonological errors by parameter in ASL and	
	in DGS	127
5.3	Slip categories/affected entities for the German slip corpus	128
5.4	Locus of repair (number and percentage) in DGS vs. Dutch	136
9.1	Summary of similarly-articulated signs for the three	
	crosslinguistic studies	229
11.1	Negation: A comparative chart	284
13.1	English personal pronouns (nominative case)	331
13.2	Asheninca personal pronouns	331
13.3	Nagala personal pronouns	332
13.4	Nogogu personal pronouns	332
13.5	Aranda personal pronouns	333
13.6	ASL personal pronouns	335

хi



X11	List of tables	
13.7	Person distinctions across signed languages	339
13.8	Number distinctions across signed languages	340
13.9	Gender distinctions across signed languages	340
13.10	Possible analogously structured system of pronominal	
	reference	343
13.11	English demonstrative pronouns	346
13.12	Quechua demonstrative pronouns	347
13.13	Pangasinan demonstrative pronouns	347
13.14	Khasi demonstrative pronouns	348
13.15	Lak demonstrative base forms	348
13.16	Lak personal pronouns	349
13.17	Bella Bella third person pronouns	349
14.1	Null agreement system: Yoruba and Japanese	371
14.2	Weak agreement system: Brazilian Portuguese and English	372
14.3	Strong agreement system: Spanish and German	373
14.4	Verb classes according to the phonological manifestation	
	of agreement	376
14.5	Verb types according to whether they accept (in)animate	
	arguments	381
15.1	Properties associated with spatial formats in ASL	411
16.1	Christopher's performance in five nonverbal (performance)	
	intelligence tests	425
16.2	Christopher's performance in two face recognition tests	426
16.3	Test of identification of iconic vs. semi-iconic and	
	non-iconic signs	430
16.4	Use of negation markers across learning period: Types,	
	tokens, and ungrammatical use	433
17.1	Narrative and subject order for data collection	450
17.2	Signed narratives: Length (in seconds) and number of signs	451
17.3	Use of indexation in the narratives	454
17.4	The use of proper names realized by fingerspelling the name	
	of the character being referred to	456
17.5	The use of GIRL and SHE by DB2	457
17.6	English features in each narrative	458



Contributors

- DIANE BRENTARI is Professor and Director of the American Sign Language Program at Purdue University, and works on comparative analyses of phonology and morphology in signed and spoken languages. She is currently investigating crosslinguistic variation among sign languages in the area of morphophonemics. Her recent books include *A prosodic analysis of sign language phonology* (1998) and *Foreign vocabulary in sign languages* (2001).
- RACHEL CHANNON recently received her doctorate in linguistics at the University of Maryland at College Park. Her dissertation considers characteristics of repetition, sequence and iconicity in sign languages and concludes that simple signs must have a single segment structure.
- DAVID P. CORINA is an Associate Professor of Psychology at the University of Washington in Seattle, WA. His research program investigates the neural representation of human languages, focusing on Deaf users of signed languages, persons with temporal lobe epilepsy and aphasic populations. He uses converging methodologies including behavioral studies, single unit recordings, cortical stimulation mapping, fMRI, and PET in order to gain insights into the neural architecture of language.
- KAREN EMMOREY is a Senior Staff Scientist at the Salk Institute for Biological Studies, La Jolla, CA. She studies the processes involved in how Deaf people produce and comprehend sign language and how these processes are represented in the brain. Her most recent book is titled *Language*, *cognition*, and the brain: Insights from sign language research (2002).
- ANNE-MARIE P. GUERRA CURRIE is at STI Healthcare, Inc. in Austin, Texas where she works on information retrieval and classification of medical record texts. Her diverse research interests include information retrieval and extraction, natural language processing, sociolinguistics, and sign language research.

xiii



xiv List of contributors

- DANIELA HAPP is a Deaf research assistant at the University of Frankfurt, Germany and works as a lecturer in German Sign Language (DGS) in the interpreter training program and in the qualification program for Deaf sign language teachers in Frankfurt. She has published curricular material for teaching DGS.
- URSULA HILDEBRANDT is a psychology doctoral student at the University of Washington in Seattle, WA. She studies perception of American Sign Language in deaf and hearing infants.
- ANNETTE HOHENBERGER is a research assistant at the University of Frankfurt, Germany and works on German Sign Language (DGS), language production, and language acquisition. Her recent book is *Functional categories in language acquisition: Self-organization of a dynamical system* (2002).
- TERRY JANZEN is an Assistant Professor of Linguistics at the University of Manitoba in Winnipeg, Canada, and his research focuses on issues in American Sign Language (ASL) syntax, discourse structure, and grammaticization. He has published recent articles on the properties of topic constituents in ASL, and on the interaction of syntax and pragmatics.
- HELEN LEUNINGER is Professor of Linguistics at the University of Frankfurt, Germany and works on the psycholinguistics and neurolinguistics of German Sign Language (DGS). She is the author of various books and articles on slips of the tongue and hand. In her current research project she investigates the effect of modality on sign and spoken language production.
- DIANE LILLO-MARTIN is Professor and Department Head at the University of Connecticut, and Senior Research Scientist at Haskins Laboratories. Her research interests include the structure and acquisition of American Sign Language, particularly in the area of syntax, and crosslinguistic studies of language acquisition.
- GAURAV MATHUR is currently a postdoctoral fellow at Haskins Laboratories in New Haven, CT. He completed his doctoral dissertation in 2000 at MIT on the phonological manifestation of verb agreement in signed languages. His research interests include the interfaces among morphology, phonology, and phonetics in signed languages.
- RICHARD P. MEIER is Professor of Linguistics and Psychology at the University of Texas at Austin, where he also directs the American Sign Language (ASL) program. Much of his research has examined the acquisition of ASL as a first language.



List of contributors xv

- SUSAN LLOYD MCBURNEY is a linguistics graduate student at the University of Washington, Seattle, WA. She works on the morphology and syntax of signed languages, the neurolinguistic processing of signed languages, and the history of the discipline of sign language linguistics.
- GARY MORGAN is a Lecturer in Developmental Psychology at City University, London. He has published on British Sign Language in the *International Journal of Bilingualism*, the *Journal of Child Language*, and the *Journal of Sign Language and Linguistics*.
- CECILE MCKEE is an Associate Professor at the University of Arizona, and works on crosslinguistic comparisons of language structures (e.g. English, Italian, American Sign Language), children's processing mechanisms, and developmental language impairments (e.g. Down syndrome). Her recent publications include *Methods for assessing children's syntax* (1996, with D. McDaniel and H. S. Cairns).
- ARIKA OKRENT is completing a joint Ph.D. in the Departments of Linguistics and Psychology at the University of Chicago.
- ROLAND PFAU is an Assistant Professor at the University of Amsterdam, the Netherlands where he teaches sign language linguistics. Besides doing research on the morphosyntax and phonology of signed languages, he works on language typology and the processing of morphosyntactic features in language production.
- DAVID QUINTO-POZOS recently received his Ph.D. in linguistics at the University of Texas at Austin. His dissertation examines the contact between Mexican and American Sign Languages along the Texas–Mexico border. He is also a certified interpreter and interpreter trainer. He now teaches in the Department of Linguistics of the University of Pittsburgh.
- CHRISTIAN RATHMANN is a doctoral student in linguistics at the University of Texas at Austin. His research interests include the interface between syntax, semantics, and pragmatics, comparative studies of signed languages, and psycholinguistics.
- BARBARA SHAFFER is an Assistant Professor of Linguistics at the University of New Mexico. Her research and publications focus on markers of modality, pragmatics, and the grammaticization of signed languages.
- NEIL SMITH is Professor of Linguistics at University College London, where he has been head of the linguistics section since 1972. His most recent books are: *Chomsky: Ideas and ideals* (1999) and *Language, bananas and bonobos* (2002).



xvi List of contributors

- SAMUEL J. SUPALLA is an Associate Professor in the Department of Special Education, Rehabilitation, and School Psychology at the University of Arizona. He co-founded the Laurent Clerc Elementary School, a charter school in Tucson, AZ as part of a university–school affiliation effort. He supports the creation of a working academic curriculum for deaf children. To this end, he has carried out research on modality issues associated with language development, especially in learning print English as a second language without the support of sound.
- FELIX Y. B. SZE is a research student at the University of Bristol, UK. Her research interests include syntax as well as information packaging in Hong Kong Sign Language.
- GLADYS TANG is an Associate Professor at the Chinese University of Hong Kong, Hong Kong. She works on sign linguistics, language acquisition, and applied linguistics. She is developing a project on sign language classifiers, their internal structure and acquisition by deaf children of Hong Kong Sign Language.
- IANTHI TSIMPLI is an Associate Professor at the English Department at the Aristotle University of Thessaloniki and is also an Assistant Director of Research at the Research Centre for English and Applied Linguistics at the University of Cambridge, UK. Her research interests include first and second language acquisition, language disorders, and formal syntax. Her book publications include *The mind of a savant: Language learning and modularity* (1995, with Neil Smith) and *The prefunctional stage of language acquisition: A crosslinguistic study* (1996).
- KEITH WALTERS is an Associate Professor of Linguistics, Anthropology, and Middle Eastern Studies at the University of Texas at Austin, where he also serves as Associate Director of the Center for Middle Eastern Studies. Much of his research focuses on the sociolinguistics of North Africa—Arabic diglossia, Arabic—French bilingualism, codeswitching, and language and education in the USA.
- BENCIE WOLL holds the Chair in Sign Language and Deaf Studies at City University London, and she is involved in all aspects of sign language and sign linguistic research. Recent publications include *The linguistics of BSL:* An introduction (1999, with Rachel Sutton-Spence) and 'Assessing British Sign Language development' (with Ros Herman and Sallie Holmes).



Acknowledgments

Few readers will be surprised to learn that this volume is the fruit of a conference. That conference – one of an annual series sponsored by the Texas Linguistics Society – was held at the University of Texas at Austin on February 25–27, 2000; the topic was "The effects of modality on language and linguistic theory." It was, we believe, a very successful meeting, one marked by the high quality of the papers and of the ensuing discussions. There are many people and organizations to whom we are indebted for their financial support of the conference and for their hard work toward its realization. Here there are two sets of friends and colleagues whom we especially want to thank: Adrianne Cheek, Heather Knapp, and Christian Rathmann were our co-organizers of the conference. We owe a particular debt to the interpreters who enabled effective conversation between the Deaf and hearing conferees. The skill and dedication of these interpreters – Kristen Schwall-Hoyt, Katie LaSalle, and Shirley Gerhardt – were a foundation of the conference's success.

This book brings together many of the papers from that conference. All are now much updated and much revised. The quality of the revisions is due not only to the hard work of the authors but also to the peer-review process. To every extent possible, we obtained two reviews for each chapter, one from a scholar who works on signed languages and one from a scholar who, while expert in linguistics or psycholinguistics, works primarily on spoken languages. There were two reasons for this: first we sought to make sure that the chapters would be of the highest possible quality. And, second, we sought to ensure that the chapters would be accessible to the widest possible audience of researchers in linguistics and related fields.

To obtain these reviews, we abused many of our colleagues here at the University of Texas at Austin, including Ralph Blight, Megan Crowhurst, Lisa Green, Scott Myers, Carlota Smith, Steve Wechsler, and Tony Woodbury from the Department of Linguistics and Randy Diehl, Cathy Echols, and Peter MacNeilage from the Department of Psychology. We, and our authors, also benefited from the substantive and insightful reviews provided by Diane Brentari (Purdue University, West Lafayette, IN), Karen Emmorey (The Salk Institute, La Jolla, CA), Elisabeth Engberg-Pedersen (University of Copenhagen,

xvii



xviii Acknowledgments

Denmark), Susan Fischer (National Technical Institute for the Deaf, Rochester, NY), Harry van der Hulst (University of Connecticut), Manfred Krifka (Humboldt University, Berlin, Germany), Cecile McKee (University of Arizona), David McKee (Victoria University of Wellington, New Zealand), Irit Meir (University of Haifa, Israel), Jill Morford (University of New Mexico), Carol Neidle (Boston University), Carol Padden (University of California, San Diego), Karen Petronio (Eastern Kentucky University), Claire Ramsey (University of Nebraska), Wendy Sandler (University of Haifa, Israel), and Sherman Wilcox (University of New Mexico). We thank all of these colleagues for the time that they gave to this volume.

Christine Bartels, who at the outset was our acquisitions editor at Cambridge University Press, shaped our thinking about how to put this book together. We are greatly indebted to her. The Children's Research Laboratory of the Department of Psychology of the University of Texas at Austin provided the physical infrastructure for our work on this book. During the preparation of this book, David Quinto-Pozos was supported by a predoctoral fellowship from the National Institutes of Health (F31 DC00352). Last – but certainly not least – we thank the friends and spouses who have seen us through this process, in particular Madeline Sutherland-Meier and Mannie Quinto-Pozos. Their patience and support have been unstinting.

RICHARD P. MEIER, KEARSY CORMIER, AND DAVID QUINTO-POZOS Austin, Texas