

WHY WE GESTURE

The surprising role of hand
movements in communication

David McNeill



Why We Gesture

The surprising role of hand movements in communication

David McNeill

University of Chicago



CAMBRIDGE
UNIVERSITY PRESS

CAMBRIDGE
UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, United Kingdom

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of education, learning and research at the highest international levels of excellence.

www.cambridge.org

Information on this title: www.cambridge.org/9781316502365

© David McNeill 2016

This publication 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 2016

Printed in the United Kingdom by Clays, St Ives plc

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

Library of Congress Cataloguing in Publication data

Names: McNeill, David, 1933–

Title: Why we gesture : the surprising role of hand movements in communication / David McNeill.

Description: New York : Cambridge University Press, 2015. | Includes bibliographical references and index.

Identifiers: LCCN 2015028157 | ISBN 9781107137189 (hardback) | ISBN 9781316502365 (paperback)

Subjects: LCSH: Gesture. | Speech and gesture. | Psycholinguistics.

Classification: LCC P117 .M36 2015 | DDC 153.6/9–dc23

LC record available at <http://lcn.loc.gov/2015028157>

ISBN 978-1-107-13718-9 Hardback

ISBN 978-1-316-50236-5 Paperback

Cambridge University Press has no responsibility for the persistence or accuracy of URLs for external or third-party internet websites referred to in this publication, and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

Why We Gesture

Gestures are fundamental to the way we communicate, yet our understanding of this communicative impulse is clouded by a number of ingrained assumptions. Are gestures merely ornamentation to speech? Are they simply an “add-on” to spoken language? Why *do* we gesture? These and other questions are addressed in this fascinating book. McNeill explains that the common view of language and gesture as separate entities is misinformed: language is inseparable from gesture. There is gesture–speech unity.

Containing more than 100 illustrations, *Why We Gesture* provides visual evidence to support the book’s central argument that gestures orchestrate speech. This compelling book will be welcomed by students and researchers working in linguistics, psychology and communication.

DAVID MCNEILL has taught at the University of Michigan, Harvard University, Duke University and the University of Chicago, where he is now an Emeritus Professor.

To my dear family, Nobuko, Cheryl and Randall

Figures

1.1	Gesture continuum. Cambridge University Press, reprinted with permission.	<i>page 5</i>
1.2	"New" gesture-action. Computer art by Fey Parrill, now on the faculty of Case Western University. Used with permission of University of Chicago Press.	6
1.3	Communicative dynamism. From McNeill (2005, p. 55). Linguistic continuum based on Givón (1985). "O-VPT" = observer viewpoint, the hands are the character or event; "C-VPT" = character viewpoint, the hands the hands of a character. Used with permission of University of Chicago Press.	13
1.4	Gesture to be mimicked A: speaker saying "he's like," conveying alarm. Hands start palm down and then rock up once in a quick motion. Cambridge University Press, reprinted with permission.	16
1.5	Gesture to be mimicked B: speaker saying "the grandmother // instead of Tweety," highlighting the plot twist. Hands move upward in unison, then downward in small beats. Cambridge University Press, reprinted with permission.	16
1.6	Gesture to be mimicked C: speaker was saying "pulls off // the cover of the cage," presenting the denouement. Two hands, palms facing up in lower right space, shove forward. Cambridge University Press, reprinted with permission.	17
2.1	"Upward hollowness" showing gesture-speech unity (repeats Figure 1.2). Computer art by Fey Parrill. Used with permission of University of Chicago Press.	23
2.2	Gestures merging. "Down the pipe" at different levels of detail. Cambridge University Press, reprinted with permission.	24
2.3	Binary oppositions, showing logical relations among terms.	37
3.1	Mathematician R seeming to hand an object with mathematical meaning to mathematician L, and L taking it. The second mathematician used his left hand, thus maintaining the side of the gesture space the first mathematician initiated (although L	

	was right-handed). The slice of space seems to have taken on a shared non-spatial, mathematical meaning.	40
3.2	Spatial discourse units during a film retelling. Used with permission of University of Chicago Press.	51
4.1	The bowling ball as a downward thrusting force was embodied in the downward hand positions at the start of preparation; also the 'hands', being shaped over the bowling ball, were those of an agent launching it. The transformation of imagery from that of the cartoon stimulus, where there was no downward thrust but a release with gravity doing the rest, was complete. Computer art by Fey Parrill. Used with permission of University of Chicago Press.	55
4.2	Catchments in a bowling ball episode description. Transcription by Susan Duncan. Used with permission of Cambridge University Press.	58
4.3	Gesture at line (e) with two fields of equivalents. Drawings by Dusty Hope.	64
4.4	Ongoingness in English. Boldface indicates a gesture stroke. Drawings by Dusty Hope.	69
4.5	Ongoingness in Turkish: (a) with "ball somehow," (b) with "while hopping," (c) with "while rolling itself." Translation by Asli Özyürek. Computer art by Fey Parrill. Used with permission of University of Chicago Press.	72
4.6	Temporal gestures formed from action-speech metapragmatic combinations with different aspects and logical action types. Used with permission of John Benjamins Publishing Company.	75
4.7	Micro-level phonological "score" from Browman and Goldstein (1990) for the utterance fragment "must be" in citation form (a) and fluent speech (b). Gestural metaphor would modify (a) in various directions of which (b) is one. In Browman and Goldstein's notation, Λ is a back vowel; i is a front vowel; σ is a sibilant; τ is dental contact; and β is bilabial contact. Used with permission of Cambridge University Press.	84
5.1	Embodiment in two bodies. Computer art by Fey Parrill. Used with permission of University of Chicago Press.	88
5.2	L mimics R's gesture and incorporates it into her GP with "boa constrictor" (not uttered by R, not in the cartoon).	89
5.3	Seat assignments for USAFIT war-game exercise. Used with permission of John Benjamins Publishing Company.	90
5.4	Two concurrent gesture metaphors for processes during an academic lecture using whole body ("process as motion") and arms ("process as rotation"). From McNeill (2005). Computer	

art by Fey Parrill. Used with permission of University of Chicago Press.	95
5.5 Spatial metaphors during a film retelling (Hitchcock's <i>Blackmail</i>). See text for explanation. Drawings by Laura Pedelty, now on the faculty of University of Illinois Medical School. Used with permission of University of Chicago Press.	96
5.6 Front doors as metaphor for restarting a house tour. From McNeill (2005). Computer art by Fey Parrill. Used with permission of University of Chicago Press.	96
5.7 English speaker's "conduit" gesture with "the final scene was ..." Palm "holds" the object—the "final scene" of the cartoon. Computer drawing by Fey Parrill. Used with permission of University of Chicago Press.	101
5.8 Beam and obstacle metaphor A. "People are walking by her and you can see though the people into her" where left hand is "the people" and right hand for "seeing" moves past it. Art by Laura Pedelty. Used with permission of University of Chicago Press.	103
5.9 Beam and obstacle metaphor B. A shadow being cast off to contact a surface. Left hand is the shadow, right hand the surface. Speaker is saying (in Georgian), "you see a shadow ... the shadow of a man in a top hat." Translated from Georgian by Kevin Tuite. Art by Laura Pedelty. Used with permission of University of Chicago Press.	104
6.1 Gesture–speech unity with recursion. Transcriptions by Susan Duncan.	113
6.2 Bonobo pantomimic/deictic gesture. Left bonobo induces right bonobo to move. Thanks to Amy Pollick.	131
6.3 Two versions of gesture-first extinction and Mead's Loop origin. Diagram based on Brown (2010), Mead's Loop annotations added. Cambridge University Press, reprinted with permission.	133
6.4 Spreading-activation scheme produces neither gesture–speech unity nor gesture-orchestrated speech, after Kopp et al. (2013).	139
7.1 "Gesture explosion" between the ages of three and four. Mandarin data collected by Susan Duncan. Used with permission of University of Chicago Press.	146
7.2 Gesture-first whole-body pantomime at the age of three compared to dual semiosis single-hand gesticulation in older child. From McNeill (2014b). Used with permission of John Benjamins Publishing Company.	147
7.3 Motion event "decompositions" to pure Manner in three languages. Computer art by Fey Parrill. Transcriptions/	

translations by S. Duncan (Mandarin) and Lisa Miotto (Spanish). Used with permission of the University of Chicago Press.	149
7.4 Ella's dual semiosis gesture-speech unity. Images recorded by Forrester (2008), deposited on CHILDES (the use of TalkBank data is governed by the Creative Commons License). Drawings by Dusty Hope. Cambridge University Press, reprinted with permission.	151
7.5 Ella's single semiosis pantomime at two years exactly. Image recorded by Forrester (2008), deposited on CHILDES (the use of TalkBank data is governed by the Creative Commons License). Drawing by Dusty Hope. Cambridge University Press, reprinted with permission.	151
8.1 IW seated at the blind designed for gesture experiments. Computer art in this and the remaining illustrations of this chapter (except Figures 8.6 and 8.7) by Fey Parrill, now on the faculty of Case Western University. Used with permission of University of Chicago Press.	160
8.2 IW iconic gesture with vision.	160
8.3 IW coordinated two-handed iconic gesture without vision.	161
8.4 Lack of topokinetic accuracy without vision.	162
8.5 IW attempts to perform an instrumental action (removing cap from thermos).	162
8.6 IW changes rate of speech and gesture in tandem, maintaining synchrony. Motion of hands outward and inward occurs at same speech points, although hands are in phase at normal speed, out of phase at reduced speed. Cambridge University Press, reprinted with permission.	164
8.7 NG's gesture, preceding, not overlapping, co-expressive speech, "through the window."	166
8.8 LB's iconic depiction, totally without speech, of Sylvester throwing a weight and launching himself. From McNeill (2005). Used with permission of University of Chicago Press.	167
8.9 Downward gestures by Broca's speaker timed with "an' down" (a-b) and "t- d- down" (c). Used with permission of University of Chicago Press.	169
8.10 Catchment from Broca's speaker made of repeated gestures in upper space. Used with permission of University of Chicago Press.	170
8.11 Wernicke's gesture with "to-it." Used with permission of University of Chicago Press.	170
8.12 Representations in the manner of Vygotsky (1987) of the relationship between thought, speech and verbal thought, adapted for Williams syndrome children.	174

Tables

2.1	Semiotic contrasts within GPs. Cambridge University Press, reprinted with permission.	<i>page 22</i>
4.1	Unpacking: a growth point calls for caused-motion, winnowing a “Making Something Happen” cohort.	57
4.2	Catchment themes.	59
4.3	Mr. A probes Mr. B.	78
4.4	Meanings attributed to the right, center and left spaces, and Mr. B’s inner speech.	79
6.1	Gesture-first advocates and supplantation of gesture by speech.	114
6.2	Pivot grammar with “want” (Braine 1963, p. 5). Prototype of gesture-first “syntax.”	117
7.1	Single and dual semiosis by a child of two years and four months, seconds apart describing the bowling ball episode (Gale Stam data; used with permission).	144
7.2	Percentage of gestures showing manner–path combination or decomposition at three ages. Decomposition percentages for the viewpoint congruent with the motion event component (C-VPT with M; O-VPT with P).	148
7.3	Proposed Acquisition 1–dark age–Acquisition 2 succession.	155
8.1	Wernicke’s unpacking.	171
8.2	Speech, gesture and estimated fields of equivalents in autistic boy’s narration. Based on Levy (2008).	176

Preface

Why We Gesture capstones three previous books—an inadvertent trilogy spanning 20 years—*How Language Began* (Cambridge University Press, 2012), *Gesture and Thought* (Chicago University Press, 2005) and *Hand and Mind* (Chicago University Press, 1992). In *Why We Gesture* the three merge into a single multifaceted hypothesis.¹ It has many facets but is one hypothesis. To present it in its fullness is the purpose of the book. The integration itself—that it is possible—is part of the hypothesis. Integration occurs because of a central idea—implicit in the trilogy, explicit here—that gestures orchestrate speech. In simplest terms, this answers the implicit question of our title: *to orchestrate speech is why we gesture*. We gesture because we speak—not that speech triggers gesture but that gesture orchestrates speech; we can speak because we gesture, rather than we gesture because we speak. To present such a package takes time and an ordering of parts but the whole is the important thing, to be grasped as such, considered all at once and all together. To this end, brevity is a virtue, and I have held the book to the main points. My impression is that many readers know one book of the trilogy or the other, but few have read them all, let alone have worked out the conceptual framework they collectively create. This is hardly surprising: it has nowhere been spelled out as such. *Why We Gesture* does it for the reader. The hypothesis in all its facets is here in one place, rendered as briefly as I can manage without losing intelligibility and completeness. Moreover, *Why We Gesture* has uncovered connections that had earlier escaped notice—the integrative role of gesture-orchestrated speech is one (mentioned in passing in *Gesture and Thought* but now on center stage). Equal

¹ With additions from a blog (Linguist List, Cambridge extras, Gesture–Speech Unity at the Origin, in 6 parts, Fall 2012), McNeill (2014b) and Levy and McNeill (2015). When I speak of “hypothesis,” I use the word in a broader and more traditional sense than its statistical understanding by many psychologists and social scientists. The *Oxford English Dictionary* captures this sense—a supposition made as a starting point for further investigation from known facts.

in importance and pervasiveness is the idea of “new” gesture-actions and how they differ from “old” action-actions, these last assumed widely as the core of gesture but that, if admitted, would decisively roadblock gesture-orchestrated speech. The principal new finding of the book is that much material coalesces naturally around these concepts.

Acknowledgments

I thank Elena Levy for her insights and gratefully followed advice on presentation as I strove to unpack the first forms of this book and equally for our collaboration on children's gesture and narrative coherence (Levy and McNeill 2015), which plays such an important part at several points in this book. Her understanding of the arguments of the book reassures me that the ideas are in what Merleau-Ponty called the world of shared meanings. Renia Lopez-Ozieblo, in a nearly year-long email exchange, raised questions and counterarguments that have done much to shape and clarify the chapter on phylogenesis. Susan Duncan has been a participant in all the "trilogy." Her insights and methods have been so thoroughly absorbed it is impossible to sort them all out. I have acknowledged her contributions wherever I can.

Maya Hickmann and Marianne Gullberg have played more of a role in the origin of this book than they perhaps realize. They kindly invited me to write a paper for their journal, *Language, Interaction, and Acquisition*, which I did (McNeill 2014b). I thank them for offering this excellent venue. In writing the paper, I saw suddenly how this book could be mutated into the form now before you. From *LIA* to the book was one step.

Without artwork, a book with gesture in a center place would hardly be possible. I thank three artists, first in time Laura Pedelty who made all the illustrations in *Hand and Mind* and is now a professor of neurology at the University of Illinois Medical School; Fey Parrill whose computer art filled *Gesture and Thought* (and much of the current book), now a professor of cognitive science at Case Western Reserve University; and for this book, Dusty Hope, a professional designer who rendered ancient videos into elegant line drawings.

The National Science Foundation, the Spencer Foundation, and the University of Chicago Beck Fund at different times supported the research from which the observations reported herein derive.

Finally, above all I thank my precious family. This book is dedicated to them. They have always been at my side. It is impossible to overstate how

important their support, intellectual as well as lovingly personal, has been. Without them this book and the three earlier books it capstones would never have begun, let alone finished. I thank them for everything they bring—joy, humor, wisdom, history, stability, motivation, beauty, music, inspiration and a wonderful shining intelligence that brightens everything.

Contents

<i>List of figures</i>	page ix
<i>List of tables</i>	xiii
<i>Preface</i>	xv
<i>Acknowledgments</i>	xvii

Part I	Gesture-orchestrated speech	1
1	Why we gesture	3
1.1	What is a “gesture”?	4
1.2	A gesture continuum	5
1.3	Notation	5
1.4	The beat	8
1.5	Emblems and pointing	9
1.6	The conception of language and gesture in this book	10
1.7	Self-demonstrations	15
1.8	The synchrony test	18
2	The growth point	21
2.1	Absorbing context	26
2.2	The dialectic	29
2.3	Minimal units	31
2.4	“Two tribes”	32
2.5	Summary of the GP	36
3	New forms of human action	38
3.1	Two kinds of action	38
3.2	Arguments for “new” gesture-actions	44
3.3	Worldviews and cross-purposes	45
3.4	Conclusion	53
4	Orchestration and unpacking	54
4.1	Orchestration and unpacking	54
4.2	The catchment	57
4.3	Multiple contexts	60
4.4	The “strong prediction”	63
4.5	Metapragmatic orchestration	65
4.6	Inner speech and Vygotskian internalization	77

4.7	The mystery of speed	80
4.8	The micro-level	82
4.9	Codability	85
4.10	Overall summary	85
5	Mimicry and metaphor	86
5.1	Why mimicry?	86
5.2	Mimicry of author-GPs	92
5.3	Mimicry in performance	93
5.4	Metaphors and metaphoricity	93
5.5	Phonetic symbolism	97
5.6	The emblem as metaphor	98
5.7	Musical growth points	104
Part II	Phylogenesis, ontogenesis, brain	107
6	Phylogenesis	109
6.1	Gesture-first	109
6.2	Mead's Loop	118
6.3	Origin of syntax	126
6.4	Evolution timeline	130
6.5	Models and modules	134
6.6	Overall summary and discussion of phylogenesis	140
7	Ontogenesis	142
7.1	Two to three acquisitions	142
7.2	"Acquisition 1" (again)—gesture-first	143
7.3	"Dark age"—extinction	144
7.4	"Acquisition 2"—gesture-speech unity	145
7.5	Discrepancy of findings, resolution	148
7.6	Third acquisition	153
7.7	Timing of gesture-speech unity	154
7.8	Summary	155
8	Brain	157
8.1	Brain model	157
8.2	Evidence of proprioception	158
8.3	Evidence of the "split-brain"	166
8.4	Evidence of language disorders	168
8.5	Specific memory	178
8.6	Another look at the brain link	182
Part III	The last page	185
9	Why we gesture (again)	187
	<i>References</i>	188
	<i>Index</i>	200

Part I

Gesture-orchestrated speech