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LINGUISTICS AND THE FORMAL SCIENCES

The formal sciences, particularly mathematics, have had a profound influence on the development of linguistics. This insightful overview looks at techniques that were introduced in the fields of mathematics, logic, and philosophy during the twentieth century, and explores their effect on the work of various linguists. In particular, it discusses the foundations crisis that destabilised mathematics at the start of the twentieth century, the numerous related movements which sought to respond to this crisis, and how they influenced the development of syntactic theory in the 1950s. This book provides a ground-breaking and detailed reassessment of Chomsky's early work, and concludes by discussing the resulting major consequences for current syntactic theory. Informative and revealing, this book will be invaluable to all those working in formal linguistics, in particular those interested in its history and development.

MARCUS TOMALIN is a Fellow of Downing College, University of Cambridge. His academic interests are wide-ranging and include syntactic theory, the history of linguistics, mathematical models of linguistic theory development, and the modelling of syntactic structure in large vocabulary speech recognition systems. He publishes regularly on these diverse topics in various international journals.

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LINGUISTICS AND THE FORMAL SCIENCES

THE ORIGINS OF GENERATIVE GRAMMAR

MARCUS TOMALIN

Downing College, Cambridge

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CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo

Cambridge University Press
The Edinburgh Building, Cambridge CB2 2RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org
Information on this title: www.cambridge.org/9780521854818

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First published 2006

Printed in the United Kingdom at the University Press, Cambridge

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

ISBN-13 978-0-521-85481-8 hardback
ISBN-10 0-521-85481-4 hardback

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since feeling is first
who pays any attention
to the syntax of things
will never wholly kiss you;

e. e. cummings

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Acknowledgments

I began tentatively to explore some of the topics presented here in November 1995, and, over the intervening years, the central issues have become increasingly distinct. As usual, this process of gradual clarification has involved numerous people, many of whom cannot be mentioned here. Explicit thanks, though, are due to Peter Matthews and Ian Roberts, who encouraged me to pursue this research at an early stage. For similar reasons, I owe a debt of gratitude to Neil Smith and Ted Briscoe, whose comments and advice were of significant value. More recently, I have benefited greatly from discussions with Theresa Biberauer and Fiorien Bonthuis: over the past two years I have repeatedly subjected them both to countless ill-formed questions and incoherent musings, and they have invariably responded with humour, intelligence, and acuity. Less obviously, perhaps, the disparate members of the Cambridge Syntax Reading Group should also be mentioned, since they have contributed to this project considerably, without necessarily realising that they were assisting. In addition, I have been enriched by my connections with various members of Downing College, especially Cathy Phillips, who has watched over me for many years now, and Will Poole, whose restless polymathic brilliance always leads me towards deeper insight.

Obviously, I am indebted to Cambridge University Press for agreeing to publish this book. In particular, Andrew Winnard has been involved in the process of manuscript preparation from the very beginning; he has been my guide throughout.

Heterogeneously, I acknowledge Phil Woodland, for offering me so many opportunities; Gary Thorne, for inexpressible friendship and inspiration; and members of my various families, both the living and the dead, for laughter, confusion, and love. Finally, though, last and most, my accomplice, Sarah, for everything.

While it is hoped that all solecisms, inexactitudes, and stupidities have been unremittingly excised from this text, the remaining errors exist to remind us of our impefections.

This book is dedicated to Arbutus Cove, Victoria B.C., where, turning the corner, I glimpsed the sea.

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Mathematical symbols

'$\forall$' indicates universal quantification: '$\forall x[\phi(x)]$' means 'for all x it is the case that $\phi(x)$ holds'.

'$\exists$' indicates existential quantification: '$\exists x[\phi(x)]$' means 'there exists an x for which $\phi(x)$ holds'.

'$\neg$' indicates negation: '$\neg\phi(x)$' means 'it is not the case that $\phi(x)$ holds'.

'$\rightarrow$' indicates implication: '$p \rightarrow q$' means 'if p, then q'.

'$\wedge$' indicates conjunction: '$p \wedge q$' means 'p and q'.

'$\vee$' indicates disjunction: '$p \vee q$' means 'p or q'.

'$\mathbb{N}$' indicates the set of natural numbers: $\mathbb{N} = \{1, 2, 3, ...\}$.

'$\in$' indicates 'is a member of': '$x \in A$' means 'x is a member of set A'.

'$\notin$' indicates 'is not a member of': '$x \notin A$' means 'x is not a member of set A'.

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Abbreviations

Books/Book-length Manuscripts/Theses

LCW	Carnap, R. (1928), *Der logische Aufbau der Welt* [*The Logical Construction of the World*]
LPV	Quine, W. V. O. (1953), *From a Logical Point of View*
LSL	Carnap, R. (1937[1934]), *The Logical Syntax of Language*
LSLT	Chomsky, N. (1975[1955]), *The Logical Structure of Linguistic Theory*
MMH	Chomsky, N. (1979b[1951]), *Morphophonemics of Modern Hebrew*
MP	Chomsky, N. (1995), *The Minimalist Program*
MSL	Harris, Z. S. (1951), *Methods in Structural Linguistics*
PM	Whitehead, A. N. and Russell, B. A. W. (1925[1910]), *Principia Mathematica* [*The Principles of Mathematics*]
SA	Goodman, N. (1951), *The Structure of Appearance*
SS	Chomsky, N. (1957), *Syntactic Structures*

Papers

'LSS'	Chomsky, N. (1955a), 'Logical Syntax and Semantics: Their Linguistic Relevance'
'SCN'	Goodman, N. and Quine, W. V. O. (1947), 'Steps Towards a Constructive Nominalism'
'SSA'	Chomsky, N. (1953), 'Systems of Syntactic Analysis'
'TMDL'	Chomsky, N. (1956), 'Three Models for the Description of Language'

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