

Cambridge University Press

978-0-521-84040-8 - Nature and Nurture in Early Child Development

Edited by Daniel P. Keating

Frontmatter

[More information](#)

#### NATURE AND NURTURE IN EARLY CHILD DEVELOPMENT

For developmental scientists, the nature versus nurture debate has been settled for some time. Neither nature nor nurture alone provides the answer. It is nature *and* nurture in concert that shape developmental pathways and outcomes, from health to behavior to competence. This insight has moved far beyond the assertion that both nature and nurture matter, progressing into the fascinating terrain of *how* they interact over the course of development. In this book, students, practitioners, policy analysts, and others with a serious interest in human development will learn what is transpiring in this new paradigm from the developmental scientists working at the cutting edge, from neural mechanisms to population studies, and from basic laboratory science to clinical and community interventions. Early childhood development is the critical focus of this book, because many of the important nature-nurture interactions occur then, with significant influences on lifelong developmental trajectories.

Daniel P. Keating is Professor of Psychology, Psychiatry, and Pediatrics; Research Professor at the Center for Human Growth and Development; and Faculty Associate in the Survey Research Center at the Institute for Social Research, all at the University of Michigan. He is also a Fellow of the Canadian Institute for Advanced Research (CIFAR) and a member of CIFAR's Successful Societies Program. Keating has held positions at the University of Minnesota; the University of Maryland; the Max Planck Institute for Human Development and Education in Berlin, Germany; and the University of Toronto. He has occasionally appeared on television, including on the *Phil Donahue Show* and the *Vision* series on TV Ontario. He has also been a guest on radio talk shows featured on the Canadian Broadcasting Corporation (CBC) and the Australian Broadcasting Corporation (ABC), focused mainly on his book (with Clyde Hertzman), *Developmental Health and the Wealth of Nations* (1999). Currently, much of his work focuses on the just-launched National Children's Study, for which he serves as an investigator in a number of capacities.

Cambridge University Press  
978-0-521-84040-8 - Nature and Nurture in Early Child Development  
Edited by Daniel P. Keating  
Frontmatter  
[More information](#)

---

# Nature and Nurture in Early Child Development

Edited by  
Daniel P. Keating  
*University of Michigan*



**CAMBRIDGE**  
UNIVERSITY PRESS

Cambridge University Press  
978-0-521-84040-8 - Nature and Nurture in Early Child Development  
Edited by Daniel P. Keating  
Frontmatter  
[More information](#)

---

CAMBRIDGE UNIVERSITY PRESS  
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore,  
São Paulo, Delhi, Dubai, Tokyo, Mexico City

Cambridge University Press  
32 Avenue of the Americas, New York, NY 10013-2473, USA  
[www.cambridge.org](http://www.cambridge.org)  
Information on this title: [www.cambridge.org/9780521840408](http://www.cambridge.org/9780521840408)

© Cambridge University Press 2011

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 2011

Printed in the United States of America

*A catalog record for this publication is available from the British Library.*

*Library of Congress Cataloging in Publication data*

Nature and nurture in early child development / edited by Daniel P. Keating.  
p. cm.

Includes bibliographical references and index.

ISBN 978-0-521-84040-8 (hardback)

1. Nature and nurture. 2. Genetic psychology. 3. Child psychology. I. Keating, Daniel P., 1949– II. Title.

BF341.N377 2010

155.42'2 – dc22 2010030830

ISBN 978-0-521-84040-8 Hardback

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

## CONTENTS

<i>Contributors</i>	page vii
<i>Acknowledgments</i>	xiii
Introduction <i>Daniel P. Keating</i>	1
1 Biological and Experiential Influences on Psychological Development <i>Michael Rutter</i>	7
2 Neural Development and Lifelong Plasticity <i>Charles A. Nelson III</i>	45
3 Mother and Child: Preparing for a Life <i>Ronald G. Barr</i>	70
4 Early Experience and Stress Regulation in Human Development <i>Megan R. Gunnar and Michelle M. Loman</i>	97
5 Biology and Context: Symphonic Causation and the Distribution of Childhood Morbidities <i>W. Thomas Boyce</i>	114
6 Understanding Within-Family Variability in Children's Responses to Environmental Stress <i>Jennifer Jenkins and Rossana Bisceglia</i>	145
7 Origins, Development, and Prevention of Aggressive Behavior <i>Richard E. Tremblay</i>	169

Cambridge University Press  
978-0-521-84040-8 - Nature and Nurture in Early Child Development  
Edited by Daniel P. Keating  
Frontmatter  
[More information](#)

---

vi

*Contents*

8	Mental Health Intervention in Infancy and Early Childhood <i>Alicia F. Lieberman and Chandra Ghosh Ippen</i>	188
9	Bringing a Population Health Perspective to Early Biodevelopment: An Emerging Approach <i>Clyde Hertzman</i>	217
10	Society and Early Child Development: Developmental Health Disparities in the Nature-and-Nurture Paradigm <i>Daniel P. Keating</i>	245
	<i>Index</i>	293

Cambridge University Press  
978-0-521-84040-8 - Nature and Nurture in Early Child Development  
Edited by Daniel P. Keating  
Frontmatter  
[More information](#)

---

## CONTRIBUTORS

RONALD G. BARR, MA, MDCM, FRCP(C), is Professor of Pediatrics at the University of British Columbia Faculty of Medicine; Head of Developmental Sciences and Child Health at the Child and Family Research Institute of BC Children's Hospital; and a Canada Research Chair in Community Child Health Research at the University of British Columbia. He is the former Director and is currently Fellow of the Experience-Based Brain and Biological Development Program of the Canadian Institute for Advanced Research. He received his medical training (MDCM) at McGill University and specialty training in pediatrics and child development at McGill (Montreal Children's Hospital) and Harvard University (Children's Hospital Medical Center). He studies the biological and behavioral co-regulatory determinants of behavior and has applied these concepts to the development of a primary educational prevention program for shaken baby syndrome (abusive head trauma) and infant abuse called the *Period of PURPLE Crying* in collaboration with the National Center on Shaken Baby Syndrome.

ROSSANA BISCEGLIA is a doctoral candidate in the Developmental Psychology and Education program at the University of Toronto. Her research interests include understanding the complex processes that contribute to psychopathology in children and adolescents. Her dissertation focuses on the developmental processes that influence mothers' sensitive responding to their infants. The thesis will also examine the relationship between maternal sensitivity and the vasopressin V1a receptor (AVPR1A) gene, and how this gene operates in conjunction with environmental influences in influencing mothers' sensitivity.

W. THOMAS BOYCE, MD, is the Sunny Hill Health Centre/BC Leadership Chair in Child Development in the Human Early Learning Partnership and the Centre for Community Child Health Research at the University of

British Columbia. He is also Co-Director of the Experience-Based Brain and Biological Development Program of the Canadian Institute for Advanced Research. He completed his BA at Stanford University, an MD at Baylor College of Medicine, and pediatric residency training at the University of California, San Francisco (UCSF). He was named a Robert Wood Johnson Foundation Clinical Scholar at the University of North Carolina and served on the pediatrics and public health faculties of UCSF and UC Berkeley. As a social epidemiologist and a developmental-behavioral pediatrician, his research addresses how neurogenomic and psychosocial processes work together to lead to differences in childhood disease across different socio-economic groups.

MEGAN R. GUNNAR, PHD, is a Regents Professor of Child Psychology at the Institute of Child Development, University of Minnesota. Her research interests focus on the effect of adverse early life care on the development of stress and emotion reactivity and regulation. Professor Gunnar is a member of the Society for Research in Child Development, the International Society on Infant Studies, the International Society of Psychoneuroendocrinology, the American Psychological Society, and the American Psychological Association. She directs a National Institute of Mental Health-supported Interdisciplinary Developmental Science Center on Early Experience, Stress, and Neurobehavioral Development and is a member of the Canadian Institute for Advanced Research Program on Experience-Based Brain and Biological Development.

CLYDE HERTZMAN, MD, FRCP(C), is Director of the Human Early Learning Partnership (HELP), College for Interdisciplinary Studies at the University of British Columbia (UBC); Tier I Canada Research Chair in Population Health and Human Development; and Professor in the School of Population and Public Health at UBC. Nationally, he is a Fellow of the Experience-Based Brain and Biological Development Program and the Successful Societies Program of the Canadian Institute for Advanced Research. He is a Fellow of the Royal Society of Canada and of the Canadian Academy of Health Sciences. Since 2008, he has been President of the Canadian Council on Early Child Development. He holds an honorary appointment at the Institute for Child Health, University College, London.

CHANDRA GHOSH IPPEN, PHD, is Associate Research Director of the Child Trauma Research Program at the University of California, San Francisco, and the Early Trauma Treatment Network, which is a member of the National Child Traumatic Stress Network (NCTSN). She has worked on

seven longitudinal studies and has conducted treatment outcome research on the effectiveness of psychosocial intervention programs with Spanish-speaking children and parents. She is coauthor of *Losing a Parent to Death: Guidelines for the Treatment of Traumatic Bereavement in Infancy and Early Childhood* (2003); director of the NCTSN Measure Review Database; co-chair of the Cultural Competence Consortium of the NCTSN; and producer and director of *Vale la Pena Recordar*, a Spanish-language video on childhood traumatic grief. As a first-generation East Indian/Japanese American, she is committed to examining how culture and context affect perception and mental health systems.

JENNIFER JENKINS, PHD, is Professor of Human Development and Applied Psychology at the University of Toronto. Previously, Dr. Jenkins was on faculty at the University of Stirling, UK, and was a Senior Clinical Psychologist at the Hospital for Sick Children, Great Ormond St., London. She obtained her PhD from the University of London. Her work focuses on the ways in which family risks shape children's socioemotional development and the effect of family stresses, both relational and socioeconomic, that influence children's developmental trajectories; she has developed, with social statisticians, methodological techniques for studying complex family structures and influences. She directs the Kids, Families, and Places longitudinal community study involving 668 newborns, their older siblings, and their parents, which looks at the moderating role of individual vulnerabilities (biological and cognitive) on the relationship between environmental stress and children's well-being. She has written on emotional development and developmental psychopathology, including coauthoring *Understanding Emotions* and *Human Emotions*.

DANIEL P. KEATING, PHD, is Professor of Psychology, Psychiatry, and Pediatrics; Research Professor at the Center for Human Growth and Development; and Faculty Associate in the Survey Research Center at the Institute for Social Research, all at the University of Michigan. He is also a Fellow of the Canadian Institute for Advanced Research (CIFAR) and a member of CIFAR's Successful Societies Program. Keating has held faculty positions at the University of Minnesota; the University of Maryland; the Max Planck Institute for Human Development and Education in Berlin, Germany; and the University of Toronto. With Clyde Hertzman, he authored and edited *Developmental Health and the Wealth of Nations*. His research focuses on the biological and developmental mediators that can explain the link from social disparities in circumstances to differential outcomes in population developmental health.

ALICIA F. LIEBERMAN, PHD, is Professor of Psychology at the UCSF Department of Psychiatry, Director of the Child Trauma Research Project, and Senior Psychologist at the Infant-Parent Program, San Francisco General Hospital, and a Clinical Consultant with the San Francisco Department of Human Services. She received her BA degree at the Hebrew University of Jerusalem and her PhD from The Johns Hopkins University. She is on the Board of Directors of Zero to Three: The National Center for Infants, Toddlers, and Their Families and on the Board of *Parents* magazine. She is the author of *The Emotional Life of the Toddler*, which has been translated into five languages. She is also a Senior Editor of *DC: 0–3 Casebook* and coauthor of *Infants in Multiproblem Families*. Her major interests include toddler development, disorders of attachment, child–parent interventions with high-risk families, and the effects of early trauma in the first years of life.

MICHELLE M. LOMAN, MA, is a graduate student in Developmental Psychopathology and Clinical Science at the Institute of Child Development, University of Minnesota. Her research interests focus on the cognitive factors and neurophysiological correlates related to how children and adolescents who experience adversity regulate their behavior. She is a member of the Society for Research in Child Development, the Society for Research in Adolescence, and the International Society for Psychoneuroendocrinology. She was a University of Minnesota Center for Cognitive Sciences trainee and is actively involved in the University of Minnesota Center for Neurobehavioral Development.

CHARLES A. NELSON III, PHD, is Professor of Pediatrics and Neuroscience and of Psychology in Psychiatry at Harvard Medical School; an affiliate faculty member in the Harvard Graduate School of Education; and a Professor in the Harvard School of Public Health. In addition, he is the Richard David Scott Professor at Children's Hospital Boston and Director of Research in the Division of Developmental Medicine. He serves on the steering committees for both the Harvard Center on the Developing Child and the Harvard Interfaculty Initiative on Mind, Brain, and Behavior. An international leader in the field of developmental cognitive neuroscience, he has achieved numerous breakthroughs in scientific understanding of brain and behavioral development during infancy and childhood. He has a particular interest in how early experience influences the course of development and in this context has studied both typically developing children and children at risk for neurodevelopmental disorders.

Cambridge University Press

978-0-521-84040-8 - Nature and Nurture in Early Child Development

Edited by Daniel P. Keating

Frontmatter

[More information](#)*Contributors*

xi

MICHAEL RUTTER, MD, FRS, is Professor of Developmental Psychopathology at the Institute of Psychiatry, King's College, London. After graduating from Birmingham University Medical School and postgraduate posts in neurology, pediatrics, and cardiology, he undertook training in psychiatry at the Maudsley Hospital in London, followed by a research fellowship at Albert Einstein College of Medicine in New York. He has served at the Medical Research Council (MRC) Social Psychiatry Unit, as Senior Lecturer at the Institute of Psychiatry in London, and as Professor of Child Psychiatry and Head of the Department of Child and Adolescent Psychiatry. He was Honorary Director of the MRC Child Psychiatry Research Unit and of the Social, Genetic, and Developmental Psychiatry Research Centre, both of which he established at the Institute of Psychiatry. His research has spanned an unusually wide range, from epidemiology to molecular genetics, with clinical research foci from autism to depression and antisocial behavior. Elected to the Royal Society in 1987, he was knighted in 1992.

RICHARD E. TREMBLAY received his PhD from the University of London (UK). He is Professor at the University of Montreal, at University College Dublin, and Invited Scientist at National Institute of Health Unit 669 in Paris. He was Canada Research Chair in Child Development, Interdisciplinary Professor at Utrecht University, Invited Professor at the Paris-Sud medical faculty, and International Professor at the University of Central Lancashire. He has conducted a program of longitudinal and experimental studies on the physical, cognitive, emotional, and social development of children from conception to adulthood, focusing on the development and prevention of antisocial behavior. He coordinates the Marie Curie International Network for Early Childhood Health Development. He is the founding director of the Centre of Excellence for Early Childhood Development; the Web-based Encyclopedia on Early Childhood Development; and Quebec's Inter-University Research Unit on Children's Psycho-Social Maladjustment. He has received numerous scholarly awards, including Grand Officer of Chile's Gabriela Mistral Order and a Fellow of the Royal Society of Canada.

## ACKNOWLEDGMENTS

There are many individuals to thank for their help in putting this book together, beginning with the contributors, who have been willing to work diligently on various phases of this project. There is a history to this book which entails additional thanks. The idea for bringing together a group of cutting-edge scientists working the frontiers of research on early child development, but who were also able to communicate with a broad audience, originated in discussions at the University of Toronto nearly ten years ago. With the strong support of the University of Toronto, two generous Canadian funders were identified who were interested in sponsoring such an effort: the Invest in Kids Foundation (IKF), based in Toronto, Ontario; and the Lawson Foundation, based in London, Ontario. Working collaboratively with the funders, a small group at the Ontario Institute for Studies in Education at the University (OISE/UT) – notably, Jane Bertrand, Jenny Jenkins, Dona Matthews, and Anita Zijdemans, with strong support from Carol Crill Russell from IKF – identified an ideal group to participate in this initiative. We were delighted that all of our first choices for each topic agreed to participate.

A unique feature of this effort is that it was intended from the start as an educational effort with a wide variety of audiences in mind. We also wanted to make use of new media to forward this goal. The initial result was the Millennium Dialogue on Early Child Development, held at OISE/UT in 2001. A cross section of stakeholders was invited to participate in this dialogue along with the contributors, both in person at the event and internationally through a simultaneous interactive webcast. (The experimental nature of this part of the effort was described and evaluated in *ePresence Interactive Media and Webforum 2001: An Accidental Case Study on the Use of Webcasting as a VLE for Early Child Development*, by Anita Zijdemans, Gale Moore, Ron Baecker, and Daniel Keating, which appeared in the

*International Handbook of Virtual Learning Environments*, Springer 2005.) The untiring efforts of many people were needed to take on the technical and logistical challenges of bringing this innovative forum together, but special thanks are owed to Jane Bertrand, Dona Matthews, and Anita Zijdemans.

One consequence of this decision, embraced by the contributors, was a conscientious effort to make the material accessible to a broad audience and to engage in dialogue with the other contributors and the larger group of participants, both in person and online. The dialogue was recorded on DVD,\* and both the conference papers and the multimedia production were subsequently utilized in an educational project for early childcare students carried out by Red River College in Manitoba, Canada, under the able leadership of Janet Jamieson. Contributors were very generous with their time in supplementing and clarifying this curriculum, which has been used successfully in Canada and elsewhere. The team at OISE/UT supported these and other efforts to make educational use of the Millennium Dialogue, and that support is gratefully acknowledged, especially as it was manifested in the funding of the Atkinson Centre for Society and Child Development, which was created to enhance the work of an endowed Atkinson Chair in this field.

Recently, additional funding was made available through the University of Toronto, thanks to the efforts of two recent Chairs of the Department of Human Development and Applied Psychology at OISE/UT, Janet Wilde Astington and Esther Geva. This funding enabled us to return to the contributors with an invitation to do a thorough revision and updating of their original conference papers, and supporting them as they did so, to bring this knowledge to a broader audience. Again, all the contributors agreed, and the chapters in this book, which originated in the Millennium Dialogue of 2001, retain their original spirit but are completely revised to make the book fully up-to-date.

Over the intervening period, some contributors requested permission to use part of their efforts in other publications, and limited copyright permission to do so was granted by the University of Toronto. Some parts of the original conference paper by Charles A. Nelson III appeared in *Promoting Positive Child, Adolescent, and Family Development: Handbook of Program and Policy Interventions* (R. M. Lerner, F. Jacobs, and D. Wetlieb (eds.), Thousand Oaks, CA: Sage Publications), and a reciprocal permission from the editor of that book for the substantially revised Chapter 2 is appreciated. Similarly, a version of the original conference paper presented at the

\* Contact [keatingd@umich.edu](mailto:keatingd@umich.edu) for availability of DVD recordings of the 2001 conference.

Millennium Dialogue on Early Child Development by W. Thomas Boyce appeared (with permission) in *Developmental Psychopathology, Volume 2: Developmental Neuroscience* (2nd edition, D. Cicchetti and D. J. Cohen (eds), John Wiley & Sons). The present version in Chapter 5 draws on those prior sources but represents a distinct and contemporary contribution to the topic. Again, the consent of the editors for this arrangement is appreciated. In addition, Megan R. Gunnar acknowledges that her work was supported by the National Institute of Mental Health Research Scientist Award (MH00946), and Tom Boyce acknowledges the research support from the John T. and Catherine D. MacArthur Foundation Network on Development and Psychopathology.

An additional connection among many of the contributors runs throughout this book, and is acknowledged with great gratitude. The origins of this work reach back to the establishment of the Human Development Program (HDP) of the Canadian Institute for Advanced Research (CIFAR). The founding president of CIFAR, J. Fraser Mustard, developed the idea of a Canadian-based organization with international scope that would take on complex, interdisciplinary topics across many fields, establishing scientific networks whose members would be supported to tackle them. The Human Development Program was one of the early efforts in the human sciences, and I was privileged to be asked to lead that effort. The ongoing influence of the inspirational and scientific leadership of Fraser Mustard, and his vision of a new approach to taking on complex, multifaceted research questions, cannot be overstated.

Following the successful completion of ten years of HDP in 2003, two related programs with new mandates were established under the leadership of current CIFAR president Chaviva Hosek: the Successful Societies Program (SSP) and the Experience-Based Brain and Biological Development Program (EBBD). Contributors to this volume who have CIFAR links include: Sir Michael Rutter (Advisory Board, EBBD); Charles Nelson (Advisory Board, EBBD); Ronald G. Barr (Fellow, EBBD; Fellow, HDP); W. Thomas Boyce (Fellow and Co-Director, EBBD); Megan Gunnar (Fellow, EBBD and HDP); Richard E. Tremblay (Fellow, HDP); Clyde Hertzman (Fellow, EBBD, SSP, and HDP); and Daniel Keating (Fellow, SSP; Fellow and Director, HDP). The scientific culture of interdisciplinary collaboration and dialogue fostered and sustained by the CIFAR programs is evident throughout this volume, and I am grateful to have benefited from it.

Daniel Keating  
Ann Arbor  
November 2009