



Tiffany Field

Infancy

The
Developing
Child

Infancy

Tiffany Field

Harvard University Press
Cambridge, Massachusetts
London, England 1990

Copyright © 1990 by the President and Fellows of Harvard College
All rights reserved
Printed in the United States of America
10 9 8 7 6 5 4 3 2 1

This book is printed on acid-free paper, and its binding materials
have been chosen for strength and durability.

Library of Congress Cataloging-in-Publication Data

Field, Tiffany.

Infancy / Tiffany Field.

p. cm.—(The Developing child)

Includes bibliographical references and index.

ISBN 0-674-45262-3 (cloth).—ISBN 0-674-45263-1 (pbk.)

1. Infant psychology. I. Title. II. Series.

BF719.F53 1990 90-37566

155.42'2—dc20

CIP

The Developing Child

Recent decades have witnessed unprecedented advances in research on human development. In those same decades there have been profound changes in public policy toward children. Each book in the Developing Child series reflects the importance of such research in its own right and as it bears on the formulation of policy. It is the purpose of the series to make the findings of this research available to those who are responsible for raising a new generation and for shaping policy in its behalf. We hope that these books will provide rich and useful information for parents, educators, child-care professionals, students of developmental psychology, and all others concerned with the challenge of human growth.

Jerome Bruner
New York University
Michael Cole

University of California, San Diego

SERIES EDITORS

The Developing Child Series

- Child Abuse*, by Ruth S. Kempe and C. Henry Kempe
Children Drawing, by Jacqueline Goodnow
Children's Friendships, by Zick Rubin
Children's Talk, by Catherine Garvey
Daycare, by Alison Clarke-Stewart
Distress and Comfort, by Judy Dunn
Early Language, by Peter A. de Villiers and Jill G. de Villiers
Early Literacy, by Joan Brooks McLane and Gillian Dowley McNamee
Fathers, by Ross D. Parke
The First Relationship: Infant and Mother, by Daniel Stern
Learning Disabilities: A Psychological Perspective, by Sylvia Farnham-Diggory
Mental Retardation, by Robert B. Edgerton
Mind and Media: The Effects of Television, Video Games, and Computers, by Patricia Greenfield
Mothering, by Rudolph Schaffer
The Perceptual World of the Child, by T. G. R. Bower
Play, by Catherine Garvey
The Psychology of Childbirth, by Aidan Macfarlane
Schooling, by Sylvia Farnham-Diggory
Sisters and Brothers, by Judy Dunn

To my parents, Betty and Harvey Martini,
my daughter, Tory, and her father, Barry,
for the most memorable infancies

Preface

The reason for writing this volume was to describe how amazing infants have turned out to be. Although there are earlier studies on infants, it is only during the last two decades that we have come to appreciate the sophistication and the complex development of the infant. Many parents are still surprised when they realize a newborn can see and hear. Imagine our surprise, then, when we discovered that newborns could do many more things: recognize their mother's face and voice, imitate facial expressions, add simple numbers, and even discriminate the sounds of music—to name only a few of their extraordinary abilities. Imagine how much more they can do as they explore the world and develop relationships.

This volume tries to cover as much of this exciting information as possible in a very small space. I have focused primarily on social-emotional development, which is my research area. However, I have also tried to give a feeling for the perceptual, cognitive, and motor development of the infant since all of these developments are inextricably entangled. Because so much happens even before birth an account is given of the development of the fetus, and because some 10 percent

of us have infants at risk there is a chapter on those infants. In addition, although many examples come from our own research, I have tried to present extensive and up-to-date references so that students as well as parents might find this volume useful.

I owe much of the inspiration for this volume to three children whose infancies I can remember: my sister Mary, a friend's daughter Loren, and my own daughter Tory. The first infancy I experienced at eight years of age and the latter two during graduate school, when I was taking care of the babies, videotaping them in every conceivable situation, and generally being entertained by their behavior. Tory's father, Barry, made the experience even more fun. Around that time I also received grant monies to study the longitudinal development of hundreds of preterm and post-term infants as well as infants of teenage mothers. While the babies I helped raise taught me that infants are extremely sophisticated, the high-risk infants showed me how resilient and invulnerable they can be. Since that time our neonatal intensive care nurseries and follow-up clinics have constantly presented new problems to be studied, and our nursery school has continually impressed me with how infants can thrive in exciting environments.

There are countless infants and parents I want to thank for these experiences. I am also very grateful to my mentors Laura Joseph, Anita Olds, Rachel Clifton, and Michael Nelson, and to my many colleagues for their inspiration and collaboration. I am indebted to Jean Greer and Jennifer Snodgrass for helping with the manuscript of this book.

Finally, I want to thank the many undergraduate, graduate, and postdoctoral students who shared wonderful ideas and helped immensely with all the research

we did; their names are on our articles in the reference lists.

My hope is that reading this book will be half as enjoyable for you as studying and writing about infancy has been for me.

Contents

	Preface	ix
1	Studying Infants	1
2	Before and After Birth	17
3	Motor Development and Learning	41
4	Emotions, Interactions, and Attachments	61
5	Peer Interactions and Daycare	85
6	Infants at Risk	103
	Afterword	127
	References	131
	Illustration Sources	161
	Index	163

1/ Studying Infants

The word “infancy” means the period without language. Thus, infancy covers the first two years of life before language emerges. People study infants for different reasons. Some view infancy as an optimal testing ground for heredity-environment or nature-nurture questions. Others view it as the first stage in human development. The recent popularity of the field suggests that infants are gradually becoming viewed as worthy of study simply because they are interesting.

The development of methods for studying infants has proceeded more slowly. Infancy as a field of study, like its parent, developmental psychology, adopted a number of experimental psychology paradigms from other fields. Methods were borrowed from animal, child, and adult laboratory studies. Although rigorous methods may contribute to the field’s status in the scientific community, some infancy researchers have been concerned about developing more ecologically meaningful methods such as naturalistic observations.

Observations of infants like those recorded by Darwin and Piaget were instrumental in establishing infancy as an area of study and provided inspiration for many laboratory studies (Darwin 1877; Piaget 1952). However, their naturalistic observation method has not been

widely accepted as a research paradigm. As many as 80 percent of all developmental investigations have been conducted in the laboratory. Because of this, many interesting behaviors of infants that lend themselves more readily to naturalistic observation—such as the exploration of objects by mouth, pointing gestures, and “container” behaviors—have not yet been researched. In an appeal for more naturalistic observation research, one developmental psychologist wrote that “A case can be made that the description of relationships in naturalistic environments, while not sufficient to establish that factor X does cause behavior Y, is necessary for such a conclusion . . . We rarely take the time to keep our experimental hands off a behavior long enough to make descriptive observations in naturalistic settings of the several dimensions and circumstances of the behavior we wish to study” (McCall 1977).

The laboratory approach derives from a world view that studies infancy to answer nature-nurture questions or to understand evolving psychological processes. Naturalistic observation, in contrast, is directed at describing the behavior that occurs in natural settings, as Darwin did with infants and with many other animal species, and Piaget did with his own infants in an attempt to develop an epistemology of the mind. It is appropriate that their behavioral descriptions be empirically tested in the laboratory. However, most laboratory experiments have involved investigations of how the infant responds to what is provided rather than what the infant spontaneously does. Both approaches are critical to the field. One describes a phenomenon, whereas the other empirically assesses the phenomenon.

Another orientation in the field of infancy is the search for predictors of later development. Sigmund

Freud and John B. Watson, as well as other developmental psychologists, assume that experiences beginning in infancy are critical for later development (Freud 1949; Watson 1928). Freud asserted that trauma during a particular stage of infancy would cause fixation, for example at the oral or anal stage, precluding development to the next stage and affecting personality characteristics such as temperament. Watson similarly believed that infants subjected to early conditioning experiences would carry the effects throughout life. Freud considered these effects reversible through therapy involving free association and dream analysis designed to analyze their earliest origins. Watson similarly considered early experiences reversible through counter-conditioning techniques.

Retrospective reconstruction of events tends to confirm a linear developmental model such as Watson's or Freud's. For example, many cerebral palsied and mentally retarded infants are found to have been subjected to a variety of adverse perinatal conditions, such as lack of oxygen. However, studies suggest that many infants experience perinatal complications but do not develop palsy or mental retardation. An additional criticism of Freud and the psychoanalytic tradition is that the infant does not appear to pass through oral or anal stages, so it is not clear how fixation could occur (Stern, 1985).

For many developmental psychologists, the failure to find continuity has given rise to theories that propose that infancy is discontinuous with later developmental stages and therefore a less critical stage of development than previously thought. As Kagan and others have suggested, the developmental course of individual infants may not be linear or even unidirectional; given the multitude of interactional events that occur, there is little reason to expect to make predictions from this ear-

liest period (Kagan et al. 1978). Lipsitt, however, has pointed out that this need not mean that there is little or no continuity between earlier conditions or experiences and later events (Lipsitt 1988). He enters two caveats: First, the overpowering or reversing effects of later experiences on a seemingly preset condition do not diminish the importance of the earlier condition. Second, the structure of behavior sometimes disguises underlying commonalities in experience; noncontinuities can be examples of continuities not yet sufficiently investigated.

Still another orientation is the highly specialized focus on psychological processes during infancy. There are problems with transferring the study of a specific process, such as memory, to the infancy stage. Unlike memory at later stages, it cannot be isolated and studied independent of perceptual, attentional, and physiological processes. Alertness, attention, perception, information processing, and remembering are not very easily separated in infants. In addition, memory is rapidly developing, so that infant memory may look very different at six months than it did at three months. Psychological processes (which by definition occur across time) are rarely longitudinally studied across infancy in the true developmental sense.

Among the methodological challenges posed for the infant researcher, then, are the needs to observe the infant's natural behaviors, to study evolving processes in the context of other related processes, and to track these longitudinally across infancy. Other methodological problems are posed by the infants themselves.

MEASURES OF INFANT RESPONSE

The infant's inability to communicate and limited response repertoire are perhaps the most serious of the

problems. An infant is unable to communicate verbally perceptions, thoughts, and feelings. In the absence of language, researchers have relied on motor and physiological responses. Among these are simple reflex behaviors, such as sucking, and voluntary behaviors, such as head turning and looking. Heart rate is the most popularly used physiological measure. Other responses that are less frequently used in the laboratory but are often recorded during naturalistic observations include eye widening, smiling, grimacing, laughing, and cooing.

Sucking, a universal activity most infants enjoy, starts in utero and continues throughout infancy. Infants can be trained at a very early stage to suck a pacifier more or less vigorously in response to the reinforcers that researchers provide (Figure 1.1). Problems with using this measure are that many breastfed babies will not suck on a pacifier; sucking often ceases when the infant's attention is captured by something else; and sucking may affect other measures being recorded. An infant who is preoccupied with sucking will often refuse to attend to other stimulation (Bruner 1973). In addition, sucking confounds the measurement of heart rate due to its "driving" effect on heart rate (Nelson et al. 1978). Head turning is also a very common behavior in the early repertoire of the infant and can be easily trained. It, too, has problems because most infants have a head-turning preference, typically to the right side.

Despite these problems, there are many ways these behaviors can show us what the infant knows or feels. For example, head turning can indicate the infant's ability to discriminate sounds coming from different directions and intensity of sucking can indicate which liquids the infant prefers. An example of a more sophisticated behavior is the newborn's ability to learn to suck for



Figure 1.1. Newborn infant learning to change its sucking behavior to hear its mother's voice.

shorter periods of time when the reinforcement is hearing its mother read Dr. Seuss's "And to Think That I Saw It on Mulberry Street" rather than hearing a stranger read the same book (DeCasper and Fifer 1980). From that behavior we can infer that the newborn recognizes and prefers its mother's voice.

Looking behavior or visual fixations are other frequently used measures. They can be reliably recorded from corneal reflections either through peepholes or by using infrared photography. They are typically used to measure attention, preference, and habituation. Habituation, the most primitive form of learning, is shown by a reduced response after repeated exposure to a stimulus. An illustration of the ways in which an infant can show attention, preference, and habituation comes from

a study we conducted on newborns' discrimination of their mothers' faces during the first day of life. If a mother's and a stranger's face are alternately presented to a newborn through a trapdoor on a stimulus box, the newborn will look for a longer time at the mother's face, suggesting an initial preference (Field et al. 1983). If the mother's face is then presented over a series of trials, the infant will look less and less at the mother's face. Once the newborn has become habituated to the mother's face, the newborn looks at the stranger's face for longer periods than the mother's face. One of the problems with the use of visual fixations is how to interpret them. If they are used as an index of preference, then longer visual fixations on a novel stimulus would be viewed as evidence of preference and of the infant having processed a previously presented (familiar) stimulus. If, however, they are used as an index of habituation, the longer visual fixations or the infants' failure to cease looking at the stimulus would be interpreted as a failure to learn.

In addition, the duration of looking appears to differ with the nature of the stimulus. Novelty, complexity, and movement are among the many qualities that affect the amount of time an infant looks at something. Infants often prolong their gaze at inanimate stimuli whereas they alternate looking toward and away from an animate stimulus. The longer fixations on the inanimate stimulus could be interpreted as a preference; yet other studies show that infants are attracted to animate stimulation. This illustrates the problem of drawing conclusions from a single behavior such as looking. Sometimes adding another measure, such as heart rate, gives us more information.

Heart rate is one of the most frequently employed physiological measures in the study of infants. Heart