Wellbeing: A Complete Reference Guide

Volume I

Wellbeing in Children and Families

Edited by
Susan H. Landry and Cary L. Cooper

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which had a major impact in the United Kingdom and Europe. Professor Cooper was Chair of the Global Agenda Council on Chronic Diseases in the World Economic Forum in 2009–2010. In 2012, *HR* magazine voted him the Fourth Most Influential HR Thinker. In 2001, he was awarded a CBE by the Queen for his contribution to occupational health.

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Introduction to *Wellbeing: A Complete Reference Guide*

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This series of six volumes explores one of the most important social issues of our times, that of how to enhance the mental wellbeing of people, whether in the developed, developing, or underdeveloped world, and across the life course from birth to old age. We know that 1 in 4–6 people in most countries in the world suffer from a common mental disorder of anxiety, depression, or stress. We also know that mental ill health costs countries billions of dollars per annum. In the United Kingdom, for example, mental health-care costs have amounted to over £77 billion per annum, the bill for sickness absence and presenteeism (people turning up to work ill or not delivering due to job stress) in the workplace is another £26 billion, and the costs of dementia will rise from £20 billion to an estimated £50 billion in 25 years' time (Cooper, Field, Goswami, Jenkins, & Sahakian, 2009). In Germany, the leading cause of early retirement from work in 1989 was musculoskeletal disease but by 2004 it was stress and mental ill health, now representing 40% of all early retirements (German Federal Health Monitoring, 2007). In many European countries (e.g., Finland, Holland, Norway, and Switzerland) the cost of lost productive value due to lack of mental wellbeing is a significant proportion of gross domestic product (McDaid, Knapp, Medeiros, & MHEEN Group, 2008). Indeed, the costs of depression alone in the European Union were shown to be €41 billion, with €77 billion in terms of lost productivity to all the economies (Sobocki, Jonsson, Angst, & Rehnberg, 2006).

The issue of wellbeing has been around for sometime but has been brought to the fore more recently because of the global recession and economic downturn, which have made the situation worse (Antoniou & Cooper, 2013). But it was as early as 1968 that politicians began to talk about the inadequacy of gross national product as a measure of a society's

success. In a powerful speech by Bobby Kennedy at the University of Kansas, when he was on the campaign trail for the Democratic Party nomination for U.S. President, he reflected:

> But even if we act to erase material poverty, there is another greater task, it is to confront the poverty of satisfaction—purpose and dignity—that afflicts us all. Too much and for too long, we seemed to have surrendered personal excellence and community values in the mere accumulation of material things. Our gross national product, now, is over $800 billion a year, but that gross national product—if we judge the United States of America by that—that gross national product counts air pollution and cigarette advertising, and ambulances to clear our highways of carnage. It counts special locks for our doors and the jails for the people who break them. It counts the destruction of the redwood and the loss of our natural wonder in the chaotic sprawl. It counts napalm and counts nuclear warheads and armoured cars for the police to fight the riots in our cities. . . . Yet the GNP does not allow for the health of our children, the quality of their education or the joy of their play. It does not include the beauty of our poetry or the strength of our marriages, the intelligence of our public debate or the integrity of our public officials. It measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country, it measures everything in short, except that which makes life worthwhile.
>
> <div align="right">University of Kansas, March 18, 1968,
http://www.americanswhotellthetruth.org/portraits/robert-f-kennedy</div>

Since that time there have been numerous studies to show that the wealth of a country is not related to its happiness (Cooper & Robertson, 2013); indeed, as you earn far beyond your means you may become less happy or content. More recently, we have had politicians like former President Sarkozy of France, Prime Minister Cameron of the United Kingdom, and the King of Bhutan extoll the virtue of gross national wellbeing; that is, that the goal of a nation's politicians should be to enhance wellbeing among its citizens, with gross national product being only one indicator of a country's success. Indeed, Prime Minister Cameron has instituted an annual assessment of this through the U.K. Office of National Statistics which measures wellbeing among a large sample of the U.K. population, publishing the results, highlighting concerns, and ultimately considering policies to deal with them. The World Economic Forum of leading global companies, nongovernmental organizations, international bodies, and global charities now has one of its Global Agenda Councils on "mental health and wellbeing." Happiness and wellbeing indices abound (e.g., The Happy Planet), and many countries are being compared and assessed on a range of

quality-of-life metrics. Indeed, in April 2012, 79 countries in the General Assembly of the United Nations signed the Bhutan Agreement, supporting the view that an overarching goal of a country should be to enhance the wellbeing and happiness of its people.

The biggest study of its kind undertaken by any government was the 2 year U.K. Government's Foresight project on mental capital and wellbeing, the aim of which was "to produce a challenging and long-term vision for optimising mental capital and wellbeing in the United Kingdom in the 21st century—both for the benefit of society and for the individual" (Cooper et al., 2009). Mental capital was defined as the metaphorical "bank account of the mind," which gets enhanced or depleted throughout the life course (see figure). Mental wellbeing was defined as "a dynamic state that refers to individuals' ability to develop their potential, work productively and creatively, build strong and positive relationships with others and contribute to their community" (Beddington et al., 2008).

Over 85 international science reviews were commissioned to assess the factors that influence an individual's mental capital and wellbeing throughout life, from early childhood to school years to working life to old age. There were numerous findings in this report, which were costed and developed as potential government policy and/or interventions. An example of some of the findings were: (a) if society does not catch learning difficulties in children early enough, there will be increased personal and economic costs downstream, leading to depleted mental wellbeing in terms of increased antisocial behavior as well as significant health costs; (b) if society does not identify the common mental disorders (CMDs) of anxiety, depression, and stress early enough, and provide appropriate treatment and support, society won't be able to tackle the 1 in 4–6 people suffering from depression and other CMDs; (c) with the workplace being more insecure, people working longer hours, and being more overloaded, occupational stress in many countries is now the leading cause of sickness absence and presenteeism, which has implications for the viability of businesses and their productivity; and, finally, (d) with the doubling of over-65-year-olds and the tripling of over-80-year-olds over the next 30 years, society needs to deal with the consequences of dementia now with preventative strategies, better early diagnosis, and more successful and evidence-based treatment regimes. The Foresight project developed many recommendations to enhance mental capital and wellbeing not only in the United Kingdom but also for other countries (Cooper et al., 2009), and its legacy has provided a roadmap for how other countries should think about this in the future, in terms of both policies and interventions for wellbeing.

Environments

Built environment and housing

Home/Family environment   School environment   Media/Information environments

Culture

Socioeconomic gradient
Age
Gender
Ethnicity
Immigration status

Education
Employment
Income
Occupational status
Social status

Transport
Housing
Living conditions

Social valuation of parenting

Social valuation of teachers and education

Obesogenic environment

Permissive environments
Minimisation of risk-taking
Media and entertainment influences
Smart motivation

(+) 'Self-controlled' Peer resistance

Mental Capital

Lifelong learning

(+)

Childhood trauma

Early school experiences

Early stress exposure

Executive function
Organising managing and controlling behaviour

'Impulsivity'
Teen pregnancy
Smoking
(−)

Social engagement
Competence
Confidence
Character
Caring
(+)

Parenting skills
Positive parenting style
Parental modelling

Self-esteem and emotional cognition

Social cognition

Early home experiences

Disposition to learn

Functional literacy and numeracy

Social maladjustment
Anti-social behaviour
(−)

Knowledge, attitudes and aspirations towards:
Parenting
Education
Health behaviours

(−)

People

Peer influence

Maternal bonding

Maternal care

Genetic endowment Parents   Teachers   Friends Peers   Mentors and role models   Friends Peers

Maternal diet
Tobacco use
Alcohol use
Drug abuse

The onset of substance use coincides with a critical maturation period of the neural substrates that are affected by alcohol and other drugs of abuse

Pregnant mother
Cytokines
Glucocorticoids
Oxidative stress
Nutritional deficit

Nutrition quality

Reward circuits and dopamine

Nutrition Sleep Exercise Nutrition Sleep Exercise Nutrition Sleep Exercise

Synaptic refinement and myelination

Biology

Foetal programming
Low birth weight
Central adipocytes
Cerebral structure
Epigenetic changes

Early development
Rapid weight gain
Innate immunity
Brain development

Childhood
Obesity
Inflammation
Response to stress

Low   High
Immune system setting   Neuro-endocrine response

Chronic

n-3 polyunsaturated fatty
vitamin E and cognitive

School

Prenatal Early-childhood (0-4)
Parental responsibility for creating the foundations for success

Child (5-12)
Primary education builds knowledge, skills, and a learner identity

Adolescent
A dynamic and critical transition to adulthood

Acquisition

Figure. Synthetic View of the Mental Capital Trajectory.

Transport

Work environment
• Managerial style
• Participation and control
• Job insecurity
• Skill utilisation and variety
• Workload and workplace
• Identity / Status / Role
• Social relationships
• Hours / Schedule
• Commuting

Community and home environment

Working longer?

Work-life
balance

Life events:
Becoming a parent
Death of a parent
Divorce
Death of a spouse
Unemployment
Financial pressures
Illness

Understanding of lifecourse factors
Attitudes and expectations towards ageing
Ageism and social marginalisation
Under-investment in older people

Social attitudes towards
drugs and alcohol

Socio-economic
status

Drug and
alcohol
abuse

Social
exclusion

Stress

Anxiety
Depression

Age-related
cognitive and physical
challenges

Chronic
illness

Waste of
Mental Capital

Stigmatisation
Feelings of shame
Hopelessness
Victim mentality
Lack of control
Loss of self-confidence
Low expectations

Cognitive resilience
and coping skills

Cognitive reserve

Physical activity
Mental activity
Social stimulation
Medication or
Dietary interventions

Living longer:
Nutrition
Lifestyle
Socio-economic status
Genes

Active
coping
strategies

Co-workers
Friends
Community

Social support

Spouse
Children
Family

Social supports?

Learning
Attention
Executive function
Episodic and working memory

Genetic vulnerability
to addictive behavior

Stress
Cardiovascular disease
Stroke
Diabetes
Rheumatoid arthritis
Cancer
Respiratory disease

Technological interventions
Early assessment and treatment of age-related disorders
Cognitive training
Pharmacological cognitive enhancement
Stem cells in neural regeneration and adult neurogenesis
Assistive technologies
Cognitive prosthetics

Nutrition   Sleep   Exercise   Nutrition   Sleep   Exercise   Nutrition   Sleep   Exercise   Nutrition

Bioscience

Genomics
Metabolomics
Transcriptomics
Proteomics

inflammation

acids, folic acid,
function?

HPA axis and SNS activation
Glucocorticoid overexposure

Adult
Obesity
Chronic inflammation
Negative mental outlook
Poor sense of control
Heightened response to stress

Later life
Accelerated ageing
Chronic diseases
Cognitive decline

Brain atrophy and white matter lesions
Accumulated damage to cells and tissues

Work   Retirement

Adult   Older adults

Coping with the many opportunities
and stresses of adult life

Dealing actively with the challenges of
ageing; using resources largely built earlier
in life

Maintenance   Decline

The Volumes in the Series

Each volume in the series has a senior editor who is a leading international scholar in a particular field, following the life-course model described by the Foresight program. We start with Wellbeing in children and families and progress to Wellbeing and the environment, Work and wellbeing, Wellbeing in later life, The economics of wellbeing, and, finally, Interventions and policies to enhance wellbeing. The contributors to each of these volumes are distinguished international academics who work in the domain covered, reviewing the evidence that can help to develop policies and interventions to enhance wellbeing in that particular context.

In the first volume on children and families we explore four different themes, with a number of chapters under each of these: the development of the early social and cognitive skills that are important in child wellbeing, parenting and children's development, school and child care-settings that impact child and family wellbeing, and stress and family and child wellbeing.

The second volume is on wellbeing and the environment. This comprises sections, with chapters in each, on wellbeing and the neighborhood, wellbeing and buildings, wellbeing and green spaces, crime and the urban environment (and the implications for wellbeing), and wellbeing and the environmental implications for design.

The third volume highlights the issues of work and wellbeing. A range of topics is covered here: the impact of job demands, the role of workplace control, the organizational characteristics of "happy organizations," leadership behaviors that influence employee wellbeing, the sustainable workforce, the "working wounded" (including stigma and return to work), organizational coping strategies and wellbeing, and many more.

The fourth volume highlights wellbeing in later life. Topics covered include the changing demographic context of aging, biological determinants and malleability of aging, psychological aspects of wellbeing in later life, nutrition and lifelong wellbeing, physical exercise and aging, combating isolation through technology in older people, the threat to wellbeing from cognitive decline, and maintaining wellbeing through the end of life, among others.

The fifth volume explores the economics of wellbeing, with chapters on income and wellbeing, alternative measures of national wellbeing, the impact of the great recession on economic wellbeing, whether recessions are good for one's health, investing in the wellbeing of children, investing in

wellbeing in the workplace, promoting health and wellbeing of older people and protecting population mental health, wellbeing during an economic crisis, and many others.

Finally, the sixth volume highlights interventions and policies that can enhance wellbeing throughout the life course. There are three sections, with chapters on the state of wellbeing science, individual/group interventions on childhood and adolescence, promoting mental health and wellbeing in schools, mindfulness training for children and adolescents, interventions in working years and post retirement, mental health promotion in the workplace, intergenerational interventions to enhance wellbeing among retired people, interventions to create positive organizations and communities with wellbeing as a business priority, the power of philanthropy and volunteering, and creating community connections. Finally, policies are discussed, such as mental health and wellbeing at the top of the global agenda, how subjective wellbeing can influence policy, media and the public's mental health, and promoting wellbeing through new technology.

These volumes contain the leading-edge research, practice, and policies to help government, businesses, local authorities, and global institutions consider how we can action some of what Bobby Kennedy suggested were an important set of outcomes for a successful society. Our institutions need to change, and we as individuals need to do so as well, if we are to achieve personal wellbeing, or as Abraham Lincoln wrote during the American Civil War, "it is not the years in your life which are important, but the life in your years." Winston Churchill reflected on this as well, when he wrote in an essay on how he dealt with the excessive pressures of life and found solace: "many remedies are suggested for the avoidance of worry and mental overstrain by persons who, over prolonged periods, have to bear exceptional responsibilities and discharge duties upon a very large scale. Some advise exercise, and others, repose. Some counsel travel, and others, retreat. . . no doubt all of these may play their part according to individual temperament. But the element which is constant and common in all of them is Change. . . a man can wear out a particular part of his mind by continually using it and tiring it, just in the same way as he can wear out the elbows of his coats. . . but the tired parts of the mind can be rested and strengthened, not merely by rest, but by using other parts. . . it is only when new cells are called into activity, when new stars become the lords of the ascendant, that relief, repose, refreshment are afforded."

I hope that these volumes will provide you with the science, practice, and tools to enhance the mental wellbeing of people in your own work.

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1

Introduction

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The wellbeing of children and families is of utmost importance to our communities, cities, and nations. This volume is a collection of chapters that address many of the issues related to understanding the wellbeing of young children and, in turn, the wellbeing of their families. The first part of this volume includes four chapters that describe different, but related, areas of children's early development that together provide an important foundation for later competence. The changes in children's self-regulation and executive control over the first years of life, described in Chapter 2, are dramatic. This is important to appreciate as these skills are critical to children's ability, at entry into school, to function somewhat independently in a classroom with all of the numerous social and cognitive demands they face in this complex setting. The inclusion of these discussions in this book is important, given how self-regulation and executive control together with emotion regulation are integral to later academic and social competence.

Chapter 3 provides a sound rationale for considering the importance of early emotional regulatory skills for understanding that early cognitive learning can be best supported if there is careful attention to these skills and the emotional climates of children's learning environment (e.g., classrooms, schools, and home). We also understand, from information provided in Chapter 4, how early math and literacy skills that develop across the first 5 years are key to understanding later academic achievement. The rigorous research described in this chapter demonstrates longitudinal support for these skills as early predictors that can guide educational policy to make informed decisions.

When Chapters 2, 3, and 4 are considered together, the complex nature of children's early development, in terms of the need to consider the interrelatedness of skills across different developmental domains in order to account for later life competence, is truly highlighted. However, in light of the dynamic nature of the early development of the many skills necessary to put children on a trajectory that will better assure life success, the evidence provided in Chapter 5 is concerning. This chapter considers the importance of intrinsic motivation for understanding a sustained high level of learning in light of the decline in this key predictor across the elementary-school years. Discussion of the factors that may buffer this decline provides hope for ways to intervene effectively.

Parts 2 to 4 of this collection of chapters explore the many factors that are documented to influence the quality and rate of development of children's abilities, such as those described in Part 1. The caregiving environment and parents' interactions with their young children are consistently documented as two of the most important environmental influences on children's outcomes. The selection of chapters in Part 2 considers the mechanisms that explain this influence, as well as some of the developmental areas that are impacted by parenting. The critical nature of parents' behaviors with their children, beginning at birth, is striking—as described in Chapter 6 in relation to early language development and emergent literacy, and in Chapter 8 in relation to executive functions. In addition to delineating the mechanisms that help explain the parent–child associations, Chapter 6 provides empirical evidence for four specific features of parents' language with their young children that could have strong implications for future interventions to facilitate parents' use of effective language support strategies. The role of parenting in understanding change in development, in contrast to the role of genetic factors in explaining stable individual differences, highlights the specific aspects of parent interactional behavior that predict variability in change or rates of growth in executive function skills. The theme of specificity is expanded on in Chapter 9, where the reader is provided with insight into the complexity of parenting in terms of its multifaceted nature. A variety of factors such as the goals of parenting (e.g., teaching values or customs, obtaining cooperation, positive engagement) and how different forms of parenting predict different outcomes are highlighted as well as the importance of considering the bi-directional nature (parent–child, child–parent) of the influence of this process. As much of what is known about the importance of early parenting is based on correlational data, Chapter 7 provides experimental research

that supports a causal influence of this environmental factor on children's development.

In Part 3, chapters explore the interplay of contextual influences on the child. This is illustrated in one chapter using a bioecological system approach that reveals how high-risk home and child-care environments are more likely to be present for children from poverty and describes the interconnectedness and joint negative influences of two low-quality caregiving environments on children's outcomes. In light of the destructive effect on children's development of low-quality early caregiving settings and growing documentation of the economic benefits of investing in high-quality early childhood programs, Chapter 13 describes the research that has informed this educational movement.

In a comprehensive discussion of the contribution of quality environmental stimulation across the period from birth to elementary school in Chapter 14, the importance of the relationship between children and adults (e.g., parents, teachers, and child-care staff) is demonstrated in terms of its potential influence on aspects of social and cognitive development including emergent literacy skills. Finally in Part 3, the influence of relationships with same-aged peers gets attention. Although much has been written about the adult–child relationship, elementary-school peers can influence children's openness to school participation and learning. Chapter 12 considers distinct types of peer relationships, how they develop, and the process by which they affect the child.

We understand, in the first chapter of the final part of this volume, that poverty in early childhood has a more lasting negative impact than poverty in later childhood. These effects are far-reaching and the things they impact include adult health status and earnings. When one considers how poverty affects multiple aspects of the young child's environment (e.g., the nurturance, physical, and nutritional), the explanation in this chapter regarding the extent to which safety nets are in place to protect young children from the devastating effect of poverty is revealing. Another chapter reveals the importance of considering characteristics of a child's neighborhood for understanding variability in child outcomes. A comprehensive discussion of the direct and indirect influences of neighborhood effects on child outcomes provides insight into the mechanisms by which neighborhoods manifest effects on children and their families. The theme of the importance of the early caregiving environment for understanding child wellbeing is reiterated in Chapter 16, although with a thoughtful discussion of the effect of negative early experiences impacting neurobehavioral development.

When children are exposed chronically to negative experiences, biological systems are activated in response to these environmental stressors that affect brain and body. Information on this process and its environmental triggers can ultimately inform preventative approaches. The final chapter in Part 4 describes such a program. Although the effects of the Family Check-Up Program have not been investigated in relation to children's physiological responses, it targets prevention of many of the negative environmental factors that are known to be triggers for elevations in cortisol levels showing higher reactivity to stress. Programs such as the Family Check-Up, which fit within the service-delivering milieu and are effective in early identification of caregiving problems with effective solutions, may advance our public health initiatives that target the wellbeing of families and their children.

Part 1

The Development of Early Social and Cognitive Skills Important for Child Wellbeing

2

Children's Self-Regulation and Executive Control
Critical for Later Years

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In everyday life, we are challenged continually to modulate our thoughts, behavior, and emotions in accordance with goals, social norms, and expectations. This ability to self-regulate has broad bearing on our competence and functioning. Indeed, deficits in the effective self-regulation of thoughts, emotions, and behavior are defining features of many psychological disorders. Not surprisingly then, self-regulation is a critical area of interest for developmental science.

Expectations for self-regulation change dramatically over the course of childhood, and particularly in the first few years of life. Although, normatively, toddlers are expected to throw tantrums in the supermarket

when denied a particular goody, this behavior is considered unacceptable from an adult. These age-related differences reflect a progression from behavior that is reflexive and modulated externally to behavior that is controlled internally in a voluntary manner (Kopp, 1982). For instance, a toddler is critically dependent on her caregiver to monitor her safety and social behavior. Although she may be responsive to instructions, ultimately these guidelines for her behavior emanate from an external source. Toddlers and infants also are driven to a large extent by external cues in their environment and tend to respond automatically. If a toddler sees a toy, she will often reach or grab for it, perhaps even grabbing it from another child. By formal schooling entry, however, most children function with far less supervision, and navigate more independently the complex social and academic demands of the classroom. What is it that allows for such a dramatic change in behavior within so short a time frame?

Executive Control

Undeniably, a driving force behind children's ability to accomplish such a remarkable transition is the development of their cognitive abilities. Toddlers are deficient in the set of volitional cognitive processes that are responsible for biasing thoughts and actions in the service of behavioral goals. This co-ordinating, tertiary set of mental processes is known as executive control (EC). In some venues, the terms EC and self-regulation are used interchangeably. However, self-regulation typically is used as a more general term for the behavioral outcome of several interacting, internal processes that is manifested across everyday contexts, including the home, the classroom, or a crowded supermarket. Processes that support effective self-regulation are not all "executive" in nature, and include a coherent sense of self, emotion recognition, a stable pattern of physiological arousal, an understanding of social norms and expectations, facility with language, and sensory motor proficiency (Kopp, 1982). Furthermore, the term self-regulation often is used in conjunction with terms from the temperament or personality literature, such as "willpower" or "stress reactivity" (Mischel & Ayduk, 2011; Rothbart, Ellis, & Posner, 2011). In contrast, EC has its roots in the cognitive and neuropsychology literatures and is framed more specifically as the mental system that draws on and integrates information and cues from long-term memory, internal states, and the immediate external context to coordinate and prioritize thoughts, emotions, and responses in the service

of goals, especially in situations where an automatic or habitual response is not appropriate (Aron, 2008; Hughes, 2002; Welsh, 2002). Note that this designation of EC as a conscious, volitional system means that its employment need not always provide the best means of self-regulation. In some cases, such as cases of immediate danger or threat, an automatic response, orchestrated by lower level response systems (i.e., run, don't think), may be more optimal. Indeed, recent research has highlighted the important role of automatic or nonconscious processes in self-regulation (Papies & Aarts, 2011). Therefore, one way to view the relation between EC and self-regulation is by thinking of self-regulation as the behavioral outcome of a dynamic interchange between several modular, bottom-up processes and the orchestrating, top-down, tertiary EC system.

What, specifically, are the mental component processes that characterize EC? Although there is continued debate regarding this question, the broad consensus in the adult literature is that EC is both unitary and differentiated in nature. Specifically, whereas adult performance on different tasks assessing EC is correlated, tasks that demand more specific abilities cluster together, generally into two or three underlying components (Friedman et al., 2008; Miyake, Friedman, Emerson, Witzki, & Howerter, 2000). One component is working memory, defined as a mental processing space that allows one to hold task-related information in mind, often while simultaneously using or manipulating this information (Baddeley, 1986; Gathercole & Pickering, 2000). A second is inhibitory control, which incorporates the ability to suppress a prepotent or impulsive response, as well as the ability to filter out distracting, goal-irrelevant information (Friedman & Miyake, 2004; Nigg, 2000). Clearly, holding personal goals or task requirements "active" in the mind, while simultaneously suppressing impulsive behavior or distracting information, is essential for self-regulated behavior (Hofmann, Schmeichel, & Baddeley, 2012). However, when the means to accomplish a goal or the goal itself changes, self-regulated behavior also entails recognizing the need for a new behavioral response and implementing it. Thus, cognitive flexibility, sometimes referred to as set-shifting, is a third important aspect of executive control, which incorporates the ability to switch flexibly from one response set to another in accordance with shifting contextual cues or task requirements. These processes—working memory, inhibitory control, and cognitive flexibility—theoretically work together in everyday life to enable an individual to regulate his or her behavior in the service of contextual and prospective demands.

A variety of psychometric tests have allowed psychologists to capture robust individual differences in the mature EC abilities of adults. The challenge for developmental psychologists, though, is to capture these abilities in their most basic or rudimentary forms and to understand the basis of development from the dysregulated toddler to the competent adult. Not surprisingly, young children generally are unable to complete EC measures designed for adults, many of which rely on well-developed modular skills such as reading. Due to these limitations in measurement, the study of EC in early childhood was largely neglected until recent decades. However, adaptations of paradigms from the animal literature and from neuropsychology have made it clear that even infants possess the capacity to hold mental representations active in service of a behavioral goal when the linguistic, perceptual, and motor requirements of the tasks are simplified (Diamond & Goldman-Rakic, 1986; Espy, 1999; Johnson, 1995). Thus, prerequisite EC skills appear to be present very early in childhood, although the tasks used to assess EC, the neural systems that support EC, and the fundamental form that EC as a latent construct takes may differ from adults'. In our own studies, we have been particularly interested in the development and structure of EC in early childhood, as well as in the potential risk and protective factors that affect trajectories of EC development.

The Development of Executive Control in Early Childhood

Results from several cross-sectional studies indicate that the preschool period may be a particularly important time for the development of EC skills (Carlson, 2005; Diamond & Taylor, 1996; Espy, 1999; Hughes, 1998; Zelazo, Muller, Frye, & Marcovitch, 2003). Between age 2 and 5 years, children progressively become able to utilize rules to guide behavior in a flexible manner (Frye, Zelazo, & Palfai, 1995; Zelazo, Reznick, & Pinon, 1995). For instance, when sorting cards by different dimensions (e.g., color and shape), children younger than 3 years of age will soon forget the rule by which they are told to sort and begin to sort in haphazard fashion. At age 3 years, most children are able to sort by one rule, but will find it difficult to flexibly switch to a new rule with a different sorting dimension. By age 5 years, children generally are able to employ these rules flexibly and to shift from sorting by one dimension to another. Similarly, children show dramatic improvements in their ability to overcome automatic response tendencies

and distracters. For example, children under the age of 4 years find it difficult to tap a dowel once when an examiner taps twice. However, their accuracy on this task increases to near ceiling levels by age 5 years (Diamond & Taylor, 1996). These and other studies suggest the preschool years may be a particularly valuable period for examining growth in EC.

Although cross-sectional studies are useful, they do not characterize variability in the developmental trajectories of individual children. To better elucidate these individual patterns of EC development in early childhood, our group has been conducting a longitudinal study of 388 children from two Midwestern study sites, which tracks their incremental gains on measures of EC. One challenge with regard to this repeated testing on EC measures across time is that children may simply remember elements of the tasks or responses across testing sessions, which could yield performance improvements representing repeated testing effects in the context of developmental change. To parse these potential testing effects from true developmental change, we employed a lagged-sequential design. Specifically, 228 children were enrolled in the study at age 3 years, with further cohorts of approximately 50 children, who had not previously been exposed to the measures of EC, added to the sample at each 9-month follow-up point. At study entry and every 9 months thereafter until age 5.25 years, children attended a laboratory visit, where they completed the same battery of tasks selected to assess putative executive skills of working memory, inhibitory control, and cognitive flexibility. Table 2.1 describes three measures, each selected to assess one of these executive components, that will be discussed below.

Figure 2.1 depicts individual and mean performance on the three EC measures at each study age point. Against a backdrop of considerable individual heterogeneity in patterns of growth, it is clear from the figure that children's mean performance on EC measures (illustrated by the bolded black line) improves dramatically through early childhood. In order to better define the average rate of change, we constructed latent growth curve models for each of the three tasks (see Figure 2.2). Age was centered at 3 years. Thus, the growth intercepts shown in Figure 2.2 represent mean performance on the tasks at age 3 years, the slope estimates represent the linear degree of change occurring per 9-month increase in age, and the quadratic estimates reflect the increase or decrease in slope with each assessment. The growth model for Nebraska Barnyard indicated that task performance increased in a linear fashion, at an average rate of 22 summary score points for every 9-month increase in age ($\chi^2(6)=10.22$, $p=.12$; CFI=.99; RMSEA=.04). By contrast, the best model of growth for Big-Little conflict trial performance

Table 2.1. Descriptions of Three Executive Function Tasks for Preschool Children.

	Description	Dependent variable
Nebraska Barnyard (Adapted from Noisy Book; Hughes, Dunn, & White, 1998)	A span-type measure of working memory administered on a touch screen computer. Children are shown a grid of 9 colored buttons depicting barnyard animals, which make the corresponding animal sounds when pressed. During test trials, the pictures are no longer present on the buttons and children are told to press, in sequence, the buttons corresponding to increasing strings of animal names read by the examiner. The task ceases after 3 incorrect trials at a given span level.	Summary score of correct presses/ incorrect presses summed across completed trials.
Big-Little Stroop (Kochanska, Murray, & Harlan, 2000)	A measure of inhibitory control requiring children to name a small shape embedded in a larger shape. For 50% of trials (nonconflict), the smaller and larger shapes match, whereas, for 50% of trials, the shapes conflict.	Proportion of correct responses for conflict trials.
Shape School Switch Condition (Espy, 1997; Espy, Bull, Martin, & Stroup, 2006)	During baseline trials, the child names a series of characters by their colors and then a series by their shapes. During the switch condition, which assesses cognitive flexibility, children are required to alternate naming by color or shape according to whether the character is wearing a hat or not.	Proportion of correct responses for switching trials of the switch condition.

incorporated a quadratic term, where accuracy improved by 41% between age 3 and 3.75 years, and then tapered off, improving by only 9% between age 4.5 and 5.25 years ($\chi^2(4) = 7.06$, $p = .13$; CFI = .98; RMSEA = .05). Gains in accuracy for the Shape School switch trials also attenuated with time,
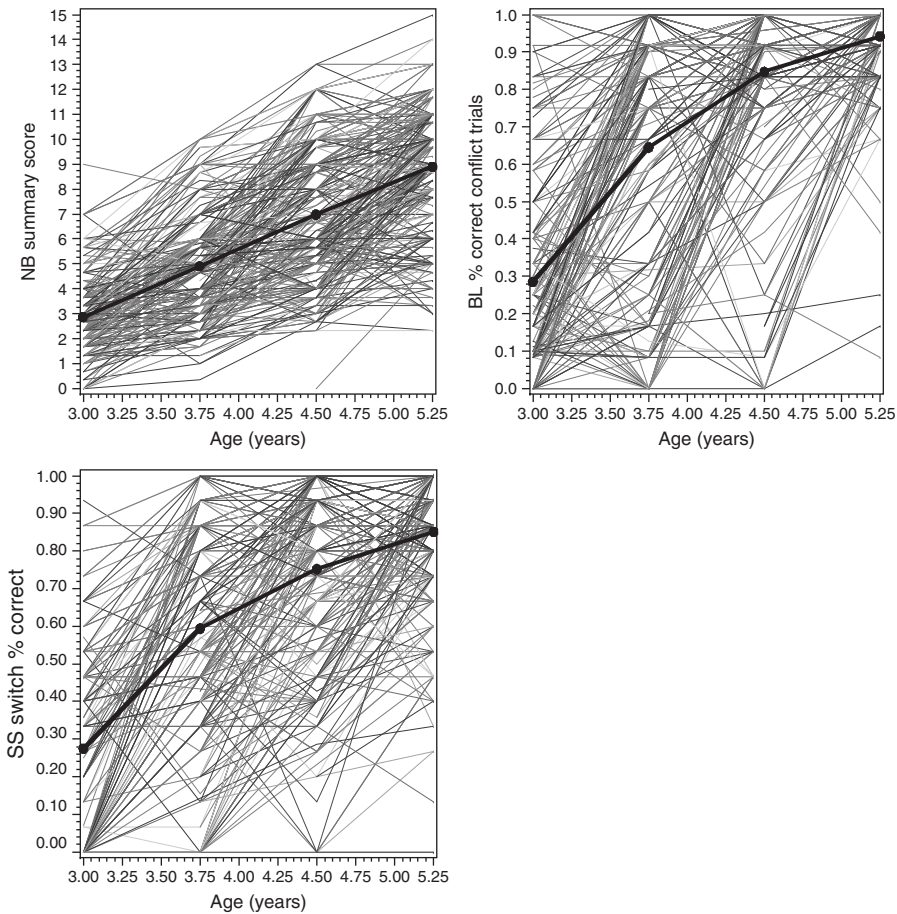
Figure 2.1. Individual and Mean Trajectories for Children's Performance on the Nebraska Barnyard, Big-Little Stroop, and Shape School Switch Tasks across Early Childhood.

increasing by 30% between age 3 and 3.75, and only by 9% between 4.5 and 5.25 years ($\chi^2(2)$=3.16, p=.21; CFI=.99; RMSEA=.04). Comparisons of mean performance for the different age of entry cohorts revealed no significant differences, allowing for greater confidence that our findings for growth in EC are not an artifact of repeated test administration.

Taken together, findings from this and other studies suggest that there may be a rapid, qualitative shift in children's ability to perform EC tasks between 3 and 4 years of age. At age 3 years, children do not demonstrate the ability to employ EC processes, in that mean performance is below 30%.
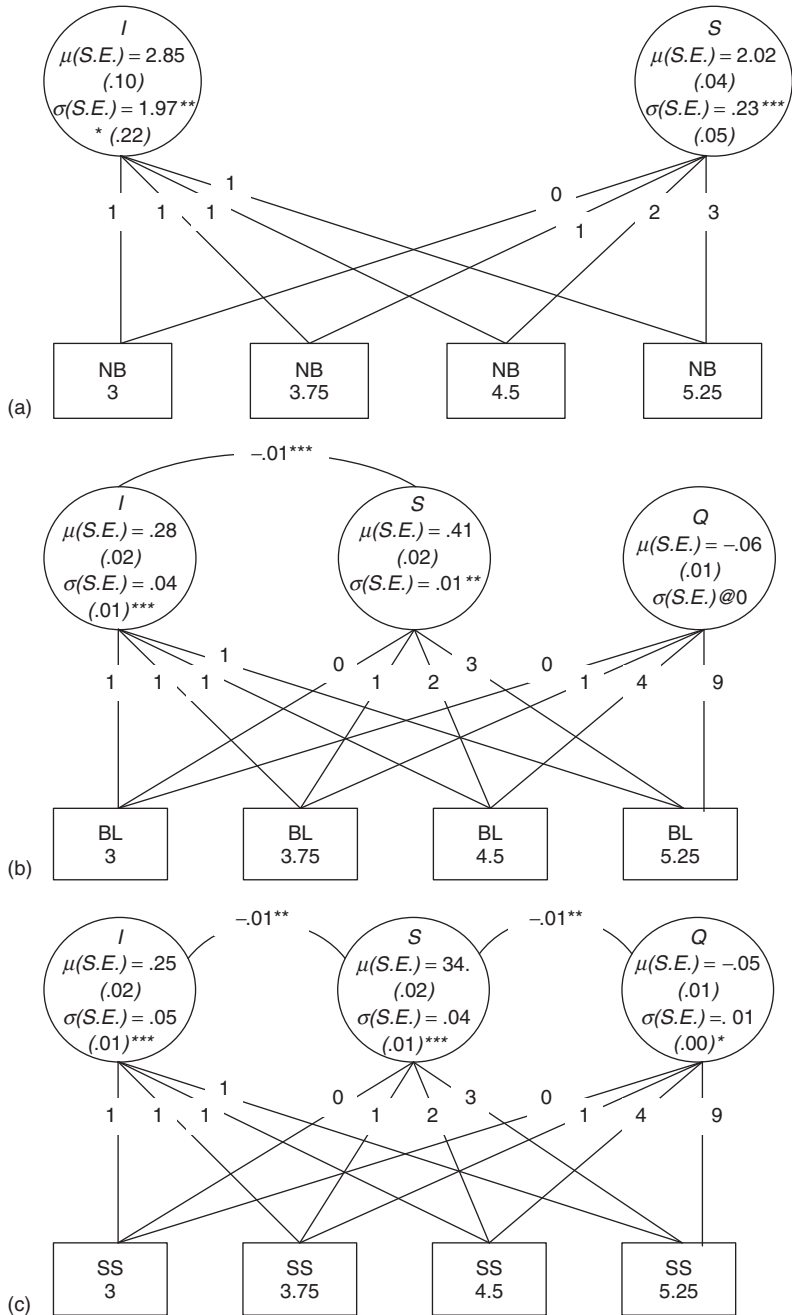
Figure 2.2. Unconditional Latent Growth Models for Children's Performance on the (a) Nebraska Barnyard, (b) Big-Little Stroop, and (c) Shape School Tasks across Early Childhood.

By age 4.5 years, children's performance has increased to over 70%, well above chance levels. Note that, for the Big-Little and Shape School tasks, children completed baseline conditions or trials where they were required only to name colors or shapes, theoretically posing minimal demands on EC. On these shape- and color-naming conditions, children's mean performance was above 70% even at age 3 years. Therefore, improved EC task performance does not appear to be the simple result of improvements in modular language or baseline naming skills, but is specific to conditions that place demands on the EC skills of interest.

Another interesting finding concerns the differences in developmental trajectories for the three tasks. As noted above, studies with school-aged children and adults have provided support for separate components of EC (Huizinga, Dolan, & van der Molan, 2006; Miyake et al., 2000; Pennington, 1998). However, there is debate as to whether the same structure is applicable in early childhood, with a growing number of studies indicating that EC may operate in a more unitary or general fashion in this young age group (Hughes & Ensor, 2010; Shing, Lindenberger, Diamond, Li, & Davidson, 2010; Wiebe, Espy, & Charak, 2008; Wiebe et al., 2011; Willoughby, Blair, Wirth, & Greenberg, 2010). Theoretically, some researchers have argued for the plausibility of a unitary EC structure because working memory and inhibition may be considered one process: activating a mental representation in working memory necessarily involves inhibiting or deactivating other representations (Pennington, 1994). Others have suggested that all EC tasks tap a common underlying core ability, which, conceptually, could operate as a fundamental substrate for EC growth (Garon, Bryson, & Smith, 2008; Miyake & Friedman, 2012). For instance, all measures of EC may require maintenance of a goal in mind and all measures of EC demand basic attention orienting. It is possible that EC skills differentiate over time from this more basic, underlying core. Differences in the shape of growth trajectories for the different tasks in our study (i.e., linear growth for Nebraska Barnyard vs. quadratic growth for Big-Little and Shape School) may reflect ceiling effects for some measures, but may also indicate subtle contrasts in the developmental trajectories of the underlying working memory, inhibitory control, and cognitive flexibility component processes that these tasks are designed to differentially assess. This differential pattern may hint that separable EC components may be emerging in early childhood, although studies examining the latent structure of EC longitudinally over a wide age range will be necessary to better address this question.

Neural Mechanisms Supporting Executive Control Development in Early Childhood

The dramatic improvements in preschoolers' EC task performance described in this and other studies likely reflect rapid changes in the growth and organization of neural systems that also occur during this age range. Based primarily on lesion studies in adults and other primates, the prefrontal cortex (PFC), particularly the dorsolateral PFC, has long been viewed as the neural region that supports EC (Levine, Katz, Dade, & Black, 2002; Phillips, 1997). It is, however, important to note that this region is densely connected to other areas, including the limbic system, parietal cortex, motor cortex, posterior association cortex, as well as subcortical nuclei. Not surprisingly, then, results from neuroimaging studies indicate that EC tasks activate networks that are distributed over frontoparietal and anterior cingulate regions (Dosenbach et al., 2007; Durston et al., 2002; Houde, Rossi, Lubin, & Joliot, 2010). Indubitably, this dense connectivity is what allows the prefrontal cortex to play a coordinating role in adult cognition.

In terms of the development of these neural circuits, between birth and age 4 years, the volume of the brain increases by 240% (Sanchez, Richards, & Almli, 2011). During the same time period, there is a rise in the glucose metabolism that peaks by age 3 years at twice the level of adults and then plateaus until age 10 years (Chugani, 1999). Resting state MRI studies also indicate quantitative changes in the connectivity of the brain, with changes being particularly rapid in the first year of life (Gao et al., 2009). However, evidence from multiple sources indicates that neural development is not simply a case of linear growth in gray or white matter (Gotgay et al., 2004). Instead, EEG studies suggest cyclic, qualitative shifts in the pattern of neural activity and connectivity through childhood. In infancy (birth–3 years), patterns of EEG activity across brain regions show minimal coherence. Beginning in the preschool period, electrical activity in brain areas that are close together becomes more synchronous, suggesting a qualitative reorganization of neural pathways in a locally connected manner (Boersma et al., 2011; Thatcher, 1992). Growth in gray matter, including cortical thickness and gray matter volume, shows a discontinuous pattern, reaching a peak in early childhood, followed by a decrease through adolescence (Shaw et al., 2008). Patterns of gray and white matter growth also vary by brain region: the sensorimotor regions of the brain mature most quickly, whereas

the PFC has the most protracted period of maturation (Gotgay et al., 2004; Knickmeyer et al., 2008; Paus et al., 1999; Sanchez et al., 2011; Shaw et al., 2008). Synaptic density in the PFC reaches its highest level during the preschool years and maintains this peak for an extended window relative to other brain regions (Huttenlocher, 1990; Johnson, 2001). Thus, the brain, and particularly the PFC, has reached a peak in growth during the preschool period, likely supporting the rapid acquisition of basic knowledge and skills.

Neural activity also appears to map functionally with EC task performance in preschoolers in a way that differs from infancy. When preschoolers perform EC tasks, the power and coherence of electrical activity, as measured by EEG, increases. Specifically, these increases in activity are localized to the frontal areas of the brain (Bell, Wolfe, & Adkins, 2007; Wolfe & Bell, 2004). In contrast, in infants performing tasks designed to assess EC, the power of EEG activity increases across the whole brain (Bell et al., 2007). The cross-sectional differences in neural activity patterns between these age groups suggest that neural activation is becoming more focused to regions that have been identified as important for EC task performance in adults, supporting the idea that the manifestation of EC abilities may reflect neural maturational changes during this important developmental period.

Sociofamilial Factors that Support the Early Development of Executive Control

The fact that EC development is subserved by neural maturation does not mean that the social environment plays no role, nor that EC is immutable to intervention. Indeed, recent research offers support for the influence of the sociofamilial environment on children's EC development (Ardila, Rosselli, Matute, & Guajardo, 2005; Farah et al., 2006; Hughes & Ensor, 2009; Mezzacapa, 2004; Noble, McCandliss, & Farah, 2007; Rhoades, Greenberg, Lanza, & Blair, 2011). Current interest in the influence of early socialization practices on the development of EC can be attributed to the growing acceptance that early environmental experiences directly impact neural development and concomitant function (De Bellis, 2001). Varied social experiences likely are an important driver of the heterogeneity in EC development that is evident in the individual growth trajectories illustrated in Figure 2.1.
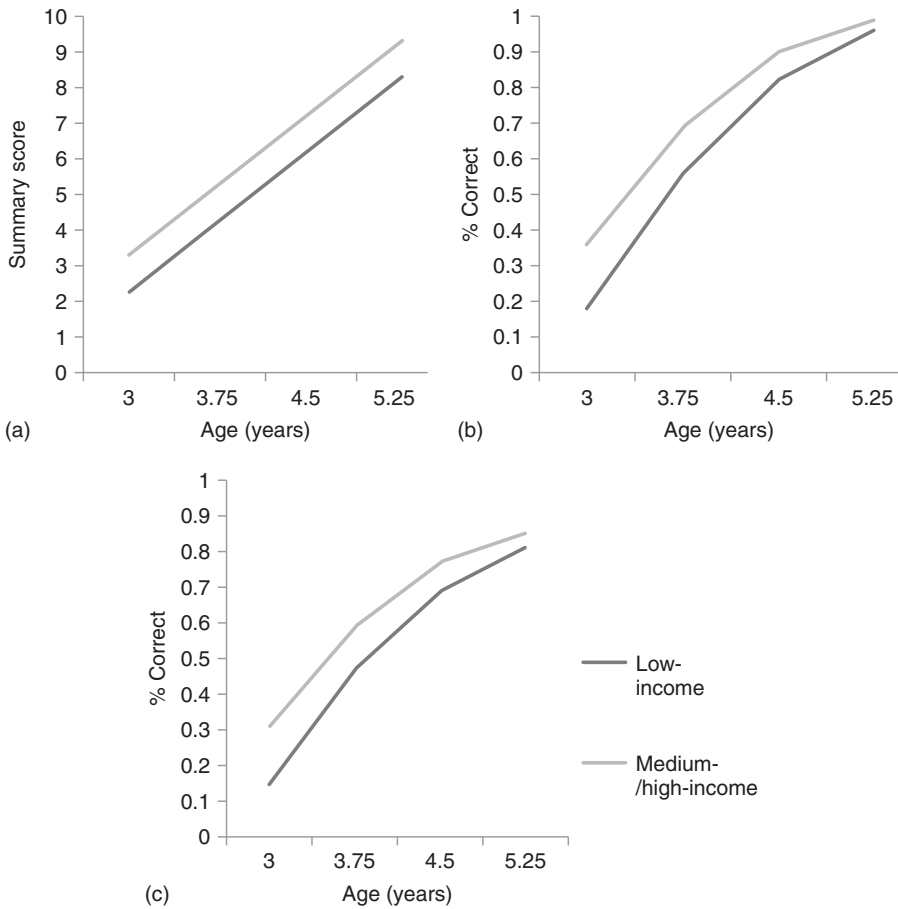
Figure 2.3. Estimated Growth Trajectories for Children from Low-Income vs. Middle- to High-Income Households for (a) Nebraska Barnyard, (b) Big-Little Stroop, (c) Shape School Switching.

In an effort to better understand the potential role of children's socio-familial environments on the development of their EC, our study sample was stratified to ensure a wide range of social background experiences. All in all, 43% of the children in our sample faced substantial financial disadvantage, as defined by the fact that their households met federal criteria for poverty. Figure 2.3 shows the estimated latent growth trajectories for the Nebraska Barnyard summary score, Big-Little conflict trial accuracy, and Shape School switching accuracy for the low-income group relative to their peers from more advantaged backgrounds. As is clear from this figure,

the average developmental trajectories of children from low-income households differed markedly from their peers. More precisely, on the Nebraska Barnyard measure of working memory, latent growth models indicated that children in the low-income group showed a persistent performance deficit relative to children from households of average and above income [$\beta = -1.02$ (S.E. $= .17$), $p < .001$]. On the Big-Little measure of inhibitory control and the Shape School switching task, low income was related both to children's mean performance level at age 3 years, and also to their rate of growth. Children from low-income households scored, on average, 18% below their peers on Big-Little conflict trials at age 3 years [$\beta = -.18$ (S.E. $= .03$), $p < .001$]. Nonetheless, their rate of growth was also more accelerated such that, by age 5.25 years, they were performing only 3% below their peers [$\beta = .05$ (S.E. $= .01$), $p < .001$]. Similarly, for Shape School switching, children from low-income households achieved an average of 16% lower than their peers at age 3 years [$\beta = -.16$ (S.E. $= .04$), $p < .001$] and again showed a quicker rate of growth [$\beta = .04$ (S.E. $= .01$), $p < .01$] so that their performance was within 3% of their peers by age 5.25 years. All in all, the growth in performance for children from low-income backgrounds lagged behind their more advantaged peers on all tasks, and they were still performing well below their peers on the Nebraska Barnyard task and somewhat lower than their peers on the Shape School switching task by kindergarten entry. These findings are in keeping with several recent cross-sectional studies indicating that poverty and low SES are associated with lower EC performance in early and middle childhood (Farah et al., 2006; Hughes & Ensor, 2005; Mezzacapa, 2004; Noble et al., 2007; Noble, Norman, & Farah, 2005).

Although it is helpful to know that children living in poverty are also at risk of delayed EC development, this information does little to inform possible intervention or remediation efforts. Therefore, recent research has begun to focus on the proximal mechanisms by which children's everyday experiences may enhance or hinder the development of their executive abilities (Bernier, Carlson, Deschenes, & Matte-Gagne, 2011; Hughes & Ensor, 2009; Rhoades et al., 2011; Sarsour et al., 2011). Low income is a proxy for several stressors that likely act cumulatively or interactively to affect the course of children's EC development. Table 2.2 illustrates this point, providing a descriptive overview of self-report, interview, and observation-based measures of children's proximal sociofamilial experiences, collected when children entered our longitudinal study. Not surprisingly, relative to their more financially advantaged peers, children from low-income

Table 2.2. Sociofamilial Background Characteristics of Children from Low-Income Households Relative to Their Peers.

	Medium–high income (*N*=219)	Low income (*N*=166)	*t*
Demographic characteristics			
Maternal years of education	15.63 (2.16)	13.70 (2.17)	8.62***
Number of people in household relative to rooms	.60 (.58)	.70 (.71)	−6.25***
% Single parent	5.26	24.04	24.05***
Everyday stressors and resources			
LISRES negative life events	49.14 (8.25)	57.2349 (14.09)	−7.05***
LISRES positive life events	61.09 (59.24)	64.49 (61.91)	−2.17*
LISRES home and neighborhood stress	46.74 (13.86)	53.22 (16.84)	−6.62***
LISRES extended family stress	50.05 (7.93)	52.90 (10.23)	−3.08**
LISRES extended family resources	51.99 (8.20)	49.70 (9.35)	2.45*
LISRES friend stress	48.12 (8.97)	49.74 (11.15)	2.45***
LISRES friend resources	57.83 (8.49)	52.73 (10.07)	5.55*
Life events in past 5 years			
Lost job	.09 (.05)	.51 (.34)	−4.67***
Spouse/partner lost a job	.15 (.09)	.86 (.51)	−3.90***
Family member badly hurt/ill	.59 (.45)	1.16 (.81)	−2.95**
Death of close family member	.70 (.86)	.93 (1.21)	−2.07*
Parental separation/break-up	.13 (.40)	1.23 (7.72)	−1.84t
Change in residence	.85 (.92)	1.73 (1.58)	−6.48***
Change in caregiver	.13 (.42)	.13 (.46)	−.01
Maternal satisfaction and support in parenting role			
SWPS parental baby pleasure	17.04 (2.25)	17.30 2.06)	−1.16
SWPS parental role satisfaction	19.17 (3.22)	18.53 (3.37)	1.89t
Maternal mental health			
BSI maternal depression	48.33 (7.86)	50.64 (9.82)	−3.49***
BSI maternal anxiety	46.03 (10.25)	47.40 (10.25)	−1.96***
Observed quality of home environment and learning resources			
EC-HOME language stimulation	55.77 (3.49)	54.13 (5.52)	3.56***
EC-HOME physical environment	56.97 (2.41)	53.55 (6.64)	7.04***
EC-HOME parental responsivity	52.60 (7.66)	50.48 (6.38)	3.23***

Table 2.2. (*Continued*)

	Medium–high income (*N*=219)	Low income (*N*=166)	*t*
EC-HOME academic stimulation	59.60 (5.15)	56.87 (7.57)	4.20***
EC-HOME parental modeling	60.45 (7.73)	56.89 (9.25)	4.11***
EC-HOME variety	50.91 (4.55)	47.13 (6.54)	6.69***
EC-HOME parental acceptance	55.67 (6.17)	53.84 (7.06)	2.7**

Note: ***$p<.001$; **$p<.01$; *$p<.05$; t $p<.1$
LISRES: Life Stressors and Social Resources Inventory (Moos & Moos, 1994); EC-HOME: Early Childhood HOME Observation for the Home Environment (Caldwell & Bradley, 1984); SWPS: Satisfaction with Parenting Scale (Ragozin, Basham, Crnic, Greenberg, & Robinson, 1982); BSI: Brief Symptom Inventory (Derogatis, 2004).

households faced higher levels of stress from multiple sources. In terms of their home settings, low-income houses were more crowded; parents in these households reported higher levels of stress related to the home and neighborhood environment; and research assistants rated low-income homes as being of poorer quality, based on factors such as safety and the quality of lighting. In addition to these physical stressors, families of low income reported higher numbers of negative life events and less household stability, including more frequent job losses, changes in residence, and romantic break-ups. Mothers from low-income households reported higher levels of stress related to extended family and friends, with fewer family and friend resources that they could draw on for support. Not surprisingly, then, these mothers also endorsed higher levels of anxiety and depression than mothers who were not financially disadvantaged. Blinded observational ratings of children's home environments showed that children from low-income households had less access to learning materials, including fewer toys and books. They were exposed to less variety and language stimulation, with lower ratings on the Acceptance and Responsivity scales of the EC-HOME indicating that their parents tended to be less nurturing and communicative and more punitive. All in all, both observational and parent-report ratings indicated that children from low-income households were more likely to face multiple daily stressors than children from financially secure backgrounds.

It is likely that these daily social and physical stressors play a key role in explaining the delayed EC development of children from low-income households. In particular, chronic daily stress and lack of access to social

and financial resources likely compromise parents' ability to provide warm, contingent, and stimulating interactions for their children. There is now burgeoning interest in and support for the role of specific parenting behaviors in promoting children's EC development (Bernier, Carlson, & Whipple, 2010; Hughes & Ensor, 2009; Landry, Miller-Loncar, Smith, & Swank, 2002; Matte-Gagne & Bernier, 2011), although it is important also to acknowledge the rich theoretical tradition interested in explaining the influence of social interactions on the development of behavioral control, particularly in the form of self-regulation. The main premise of studies that have examined the relation of caregiving behaviors to children's self-regulation is that parents provide an initial framework for self-regulation by formulating and managing rules to externally guide child behavior. As cognitive abilities mature, children begin internalizing their caregivers' regulatory requests, which eventually become part of their own self-regulation schemes. Moreover, in order for caregiving behaviors to effectively foster the development of child self-regulatory competencies, they must be age-appropriate and delivered in a sensitive manner.

Caregiving behaviors that have been examined in relation to the development of self-regulation can broadly be categorized into two dimensions, namely, parental control and sensitivity. Parental control refers to the level of structure imposed by the caregiver while interacting with the child. Although some studies have shown that parental control has positive association with children's self-regulatory competencies (e.g., Belsky, Rha, & Park, 2000; Feldman & Klein, 2003), others have linked parental control to self-regulation and EC difficulties (Assel, Landry, Swank, Smith, & Steelman, 2003; Kochanska & Knaack, 2003). The lack of agreement among empirical findings may derive from discrepancies in the conceptualization of parental control (Karreman, van Tuijl, van Aken, & Dekovic, 2006). Specifically, some researchers argue for the need to distinguish between *positive* (i.e., directive behaviors characterized by attempts to teach, encourage, and guide the child's behavior) and *negative* (i.e., power-assertive control, including physical intervention) aspects of control (Westerman, 1990). Positive parental control may promote the development of EC by providing support and guidance while still allowing for autonomous problem-solving attempts. By adjusting their level of support and structure, parents progressively scaffold children's thinking and exploration of rules and associations. In addition, positive control may foster child self-regulatory capacities by rewarding successful child self-regulatory efforts (Putnam, Spritz, & Stifter, 2002). In contrast, parental negative control behaviors are likely to be

overwhelmingly stimulating and may hinder the development of children's self-regulation capacities by preventing children from exercising independent problem solving (Kochanska & Aksan, 1995).

Generally, parental responsiveness has been found to foster the development of child self-regulatory capacities (Belsky et al., 2000). Parental responsiveness includes behaviors that promote positive caregiver–child interactions, including positive affect, acceptance, sensitivity, warmth, and synchronized exchanges (Kochanska & Aksan, 1995). Parental responsiveness has been hypothesized to indirectly influence child self-regulation by creating a positive, harmonious environment for positive caregiver–child interactions to occur. Positive experiences during parent–child interactions foster a sense of acceptance and closeness to parents, which, in turn, promotes the internalization and acceptance of parental messages, including those related to self-regulation (Kochanska & Aksan, 1995).

A limitation of most studies examining the relation of parenting behaviors to children's EC and self-regulatory competencies is that they have focused primarily on how parental behaviors contribute to parent–child interactions while neglecting the contribution of the child. As developmental science moves forward in its endeavor to describe the relation of the environment to children's EC, it will be important to progress beyond the documentation of unidirectional associations flowing from parent to child. Children with different temperaments or biological adversities differ in their susceptibility to the effects of parenting behaviors (Belsky, 1997, 2005; Eisenberg et al., 1999) and the interaction between children's temperament and parenting behavior may lead to different outcomes, including those related to the development of self-regulatory capacities.

Similarly, to adequately evaluate the impact of social influences on the development of self-regulation and EC, it is necessary to examine the context in which their development takes place (Carlson, 2009). Participating in social interactions and developing self-regulatory competencies are developmental experiences shared by all children. However, the meaning, expression, and experience of these important aspects of development are likely to be shaped by the sociocultural context in which they occur, as well as the cultural values endorsed by a specific group. Potentially, examining the characteristics of social interactions as dynamic exchanges that occur within a particular context may help to determine whether similar socialization practices (including parenting practices) have the same impact on the development of self-regulation and EC or whether their influence is specific to a particular sociocultural context.

The Relevance of Executive Control for Later Academic Achievement, Behavior, and Socioemotional Wellbeing

The importance of understanding the developmental underpinnings and factors that contribute to EC is underscored by numerous studies highlighting the predictive value of early EC for children's development across academic, social, and behavioral domains. Executive control performance in preschool and kindergarten has been shown to predict achievement in reading and mathematics through middle childhood (Bull, Espy, & Wiebe, 2008; Bull, Espy, Wiebe, Sheffield, & Nelson, 2011; Bull & Scerif, 2001; Clark, Pritchard, & Woodward, 2010; Clark, Sheffield, Wiebe, & Espy, 2013; Hughes & Ensor, 2009; van der Sluis, de Jong, & Van der Leij, 2004; Welsh, Nix, Blair, Bierman, & Nelson, 2010). For instance, Bull, Espy, and Wiebe (2008) showed that children with higher performance on measures of working memory and cognitive flexibility in preschool also demonstrated higher performance on standardized school-based assessments of reading and mathematics through to age 7 years. By middle childhood, children who have low achievement in mathematics, reading, and language comprehension also show deficits on measures of EC (D'Amico & Guarnela, 2005; Daneman & Merikle, 1996; de Jong, 1998; Geary, 2004; Passolunghi & Siegel, 2001).

As an example of the strong associations between early growth in EC and later academic achievement, Table 2.3 shows the results of models regressing children's performance on the Woodcock-Johnson III Applied Problems subtest (Mather, 2001), administered in our study when children were aged 5.25 years, on their latent growth estimates (i.e., growth intercepts and slopes) for the Nebraska Barnyard, Big-Little, and Shape School switching tasks. The Applied Problems subtest measures children's ability to utilize mathematical concepts to solve story- and picture-based problems. As shown in the first regression model, children from low-income households performed almost half a standard deviation below their peers on the Applied Problems test at age 5.25 years. However, in all cases, EC task performance fully mediated this relation, such that: for every one-point advantage in Nebraska Barnyard performance at age 3 years, children's performance on the Applied Problems subtest was .3 standard deviations higher than the average; for every 10% advantage in Big-Little performance at age 3 years, children's Applied Problem solving was .35 standard deviations higher than average; and for every 10% advantage in Shape School switching

Table 2.3. Early Childhood Growth on Executive Function Tasks through Preschool as Predictors of Children's Applied Mathematical Problem-Solving Skills at Kindergarten Entry.

	Woodcock-Johnson applied problems performance (5.25 years[1])	
	B (SE)	**β**
Model 1 (R^2=.06)		
Low-income	−.493 (.11)	−.24 (.05)***
Model 2 (R^2=.47)		
Low-income	−.18 (.11)	−.09
Nebraska Barnyard intercept	.29 (.05)	.44***
Nebraska Barnyard slope	1.01 (.21)	.52 ***
Model 3 (R^2=.29)		
Low-income	.55 (.34)	.27
Big-Little intercept	3.51 (.54)	.69***
Model 4 (R^2=.45)		
Low-income	.18 (.17)	.18
Shape school intercept	4.50 (.49)	.71***

Note: [1] Standardized to a *z* scored for interpretability; ***p<.001

performance at age 3 years, children's Applied Problems performance was .45 standard deviations above average. In addition, a higher rate of growth in Nebraska Barnyard performance was associated with a higher score on the Applied Problems subtest at age 5.25 years. Taken together, findings indicate that children who show higher EC task performance at the age of 3 years also show higher mathematics achievement 2 years later, which no doubt increases their readiness to transition to formal classroom learning.

The precise mechanisms that link EC to children's academic performance are, as yet, unclear. From a theoretical perspective, however, it seems reasonable to expect that working memory would be important for mathematics performance and reading comprehension, assisting children to hold interim steps and contextual information in mind while performing procedures. Similarly, inhibitory control and cognitive flexibility may be important as children need to focus on relevant information and procedures that change across problems, while filtering out distracting or irrelevant information. There is also some suggestion that relations between EC and academic skill acquisition may be reciprocal in nature. For instance, in a sample of children from Head Start classrooms, Welsh et al. (2010) showed that EC performance at the beginning of Head Start predicted numeracy at the end of

the year. However, numeracy at the beginning of Head Start also predicted EC performance at the end of the year. This pattern of relations implies that practice in EC skills gained through numeracy activities may also foster performance on EC tasks.

Apart from academic achievement, EC is an important predictor of children's social and behavioral development. Several studies have shown correlations between EC and social awareness, as evidenced by performance on Theory of Mind (TOM) tasks in preschoolers, even after controlling for language skills and general cognitive achievement (Carlson, Mandell, & Williams, 2004; Carlson & Moses, 2001; Hughes & Ensor, 2007; Müller, Liebermann-Finestone, Carpendale, Hammond, & Bibok, 2012). Collectively, these results suggest that overlapping processes may be engaged by these tasks. For instance, both EC and TOM tasks involve the suppression of dominant response, namely the compulsion to respond automatically to immediate information, in favor of a planned response that takes into account long-term memory and task-relevant information (Carlson et al., 2004). Although the majority of studies of children's EC in relation to their social competence have used TOM tasks, a study by Rhoades, Greenberg, and Domitrovich (2009) indicated that preschoolers' performance on a measure of inhibitory control was related to their teachers' evaluation of their socioemotional competence. Similarly, several studies by Kochanska and colleagues have linked effortful control, a construct very similar to inhibitory control, to children's moral behavior and modulation of anger (Kochanska & Aksan, 2006; Kochanska, Murray, & Coy, 1997; Kochanska, Murray, & Harlan, 2000).

Children who meet diagnostic criteria for behavioral disorders, including Attention Deficit Hyperactivity Disorder, Oppositional Defiant Disorder, and Autism show deficits in EC task performance that may drive their behavior problems (Brocki, Nyberg, Thorell, & Bohlin, 2007; Hughes & Russell, 1993; Ozonoff & Jensen, 1999; Raaijmakers et al., 2008). In community-based samples of young children, lower levels of EC performance predict higher levels of problem behaviors, including aggression, attention problems, and poor emotional control (Espy, Sheffield, Wiebe, Moehr, & Clark, 2011; Hughes, White, Sharpen, & Dunn, 2000). Theoretically, EC may act to moderate children's responses to behavioral cues in the environment, allowing for inhibitory control of inappropriate behavior and creating a temporal buffer for a more controlled internal analysis of the effects of particular responses (Barkley, 1997).

EC task performance is correlated with measures of children's ability to suppress disappointed and positive emotion in early childhood (Carlson & Wang, 2007). However, research also suggests a reverse association, whereby emotional arousal affects EC task performance. For instance, one study showed that preschoolers' performance on a measure of cognitive flexibility was facilitated by emotional stimuli, and particularly by happy emotional stimuli (Qu & Zelazo, 2007). From an evolutionary standpoint, it is conceivable that, when confronted with negative emotion or stress, EC processes might become blunted and attention may be absorbed to adaptively assess and respond to threat. When the emotional context is more neutral or positive, the individual may be better able to focus on broader contextual goals. These intersections between bottom-up emotional processes and top-down EC are, as yet, poorly understood, but are at the forefront of current research and may be particularly important in understanding the relations between child temperament, sociofamilial stress, poor EC, and developmental psychopathology. All in all, studies have clearly demonstrated strong predictive relations between early EC task performance and later academic achievement, theory of mind and behavioral difficulties, in keeping with a view of EC as broadly supporting self-regulated behavior across everyday contexts.

Conclusions

Effective self-regulation of thoughts, emotions, and behavior represents a major developmental task of early childhood. Our findings and those of others indicate that (a) early childhood, and particularly the third year of development, is a key period for the emergence of EC skills that support self-regulation; (b) the developmental course of EC skill acquisition is altered dramatically by sociofamilial risk; and (c) the level of a child's EC ability in early childhood is predictive of developmental outcomes across multiple domains. Although our focus has been on risk for poor developmental outcomes, findings also have wide implications for early intervention and prevention science.

A particularly powerful medium for early EC training may be the preschool classroom. Small effects for some programs that have already been evaluated provide some scope for optimism. The Tools of the Mind curriculum targets self-regulation with the use of visual cues and pretend play. In a randomized intervention study, children who completed the Tools curriculum showed accuracy rates that were 20–30% higher than children assigned

to a different curriculum on independent measures of inhibitory control (Diamond, Barnett, Thomas, & Munro, 2007; Diamond & Lee, 2011). These effects are limited, however, to inhibitory control tasks, with no discernible effects for mathematics, phonological skills, or early reading and print knowledge (Barnett et al., 2008). The preschool PATHS curriculum has also been trialed in Head Start classrooms. This intervention targets emotional regulation and classroom rules and routines. At the end of the year, preschool children who had received the intervention showed slightly higher scores on EC measures of cognitive flexibility and task-orientation relative to a control group who received the regular curriculum (Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008). Thus, while initial programs have shown small effects, with limited transfer, they do offer some promise for addressing gaps in preschoolers' EC that presage poor achievement in the classroom. Unfortunately, despite millions of dollars' worth of federal funding, the majority of 3- and 4-year-old children living in poverty in the United States do not attend preschool (Barnett, 2010). Thus, whilst developmental science is now equipped with new, promising knowledge of the antecedents and long-term importance of early EC, a core challenge for the future will be to ensure that this research becomes accessible to those children and families who are most likely to benefit from its utilization.

Acknowledgments

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3

Children's Emotion Regulation in Classroom Settings

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Much of developmental and educational research regarding children's achievement in classroom contexts emphasizes the role of early language and math-related skills. In light of recent rigorous analyses by Duncan et al. (2007), this emphasis makes sense: Their analyses of several large, longitudinal-survey data sets suggest that much of the gap between high-versus low-achieving children's academic performance in third grade can be traced to differences in their literacy and math scores as early as kindergarten. This chapter argues for the intellectual and policy benefits of using a different lens through which to understand children's successes and difficulties in classroom and school contexts. Specifically, I consider ways that early learning may be bolstered or constrained not only by early cognitive skill, but also by children's emotional regulatory skills and by the emotional climates of classrooms and schools.

The following chapter first explores the key mechanisms by which children develop competent versus compromised emotion regulation, and the ways that children's emotion regulation may, in turn, support versus constrain learning in educational settings. In so doing, it outlines the neurobiological basis for why emotion regulation may matter for both academic and social success in school. It then considers the contexts of school settings from an emotional regulatory perspective, considering the ways that teachers

and peers not only provide cognitively oriented instructional inputs but also foster an emotional climate that might be alternately disruptive or supportive of children's emotional and cognitive development. The chapter then highlights ways in which these processes may be particularly important for children facing the substantial risks to school success posed by cumulative exposure to income poverty and the environmental stressors that are associated with economic disadvantage. Finally, it reviews findings from several recent interventions targeting children's ability to modulate their emotions and behavior within classroom contexts. Those findings suggest that our field is at a crossroads where old and new paradigms are able to be integrated in productive ways that have major implications for both basic developmental science and educational intervention.

Emotion Regulation: Definitions and Links to Learning

What is emotion regulation? From a broad-brush perspective, self-regulation can more generally be understood at both behavioral and neural-system level (see Blair & Razza, 2007 for a comprehensive review of these two disciplinary perspectives). When considering children's modulation of emotion, many investigators in this area of developmental science focus on both the intrinsic and interpersonal components of regulation. That is, from an intrinsic or an intra-individual perspective, children modulate feelings of anger, sadness, fear, interest, and joy at the physiological, subjectively experienced, and behavioral levels often in service of a goal (Gross & Thompson, 2009). Researchers in this area seek to understand ways that children differ not only in their temperamental proneness to experience emotions with greater versus less intensity (termed "reactivity"), but also in their capacity to manage or modulate negative emotions in order to be able to meet specific goals (Calkins & Fox, 2002).

In addition, few theoretical frameworks of emotion in early childhood are complete without including the interpersonal dimensions of emotion, where children's styles of regulating their emotions are shaped by, and indeed shape, relationships with others, whether they be caregivers, siblings, valued friends, or nettlesome antagonists (Calkins & Hill, 2009; Cole, Martin, & Dennis, 2004). When applied to classrooms, this interpersonal dimension of emotion regulation becomes clearly salient for learning: Children with higher emotional competence (as indexed by accuracy in identifying emotions, modulating emotions, and responding prosocially in emotionally volatile

situations) are more engaged in the classroom and are perceived by teachers as more academically and socially competent than children experiencing difficulty with emotion regulation (Denham, 2006; see Raver, 2002 for review). But is it simply that children who are more emotionally positive are the beneficiaries of more positive social reputations, or do these children have fundamentally different cognitive and attentional processing advantages that substantially support their learning in ways that are neurobiologically different than for those children with emotional regulatory difficulties?

Emerging evidence from the fields of affective and cognitive neuroscience suggest the latter. Cutting-edge research highlights the roles of key areas of the brain (including the anterior and medial temporal lobes, the amygdala, the anterior cingulate, and the prefrontal cortex) in recognizing, responding to, and acting on emotionally arousing information. Several of those same areas of the brain have also been found to play central roles in children's deployment of attention and their ability to use higher order cognitive processing (or executive function) skills (Blair & Dennis, 2010). These systems are increasingly understood as bidirectional, with "top-down" processes that support children's attention deployment and cognitive control playing key roles in modulating emotion. These top-down processes work conjointly with the "bottom-up" processes involved in the initial perception and encoding of emotional stimuli (Ochsner & Gross, 2007; Volman, Roelofs, Koch, Verhagen, & Toni, 2011). It is through these top-down and bottom-up processes that emotional stimuli are recognized, interpreted, amplified, or reappraised and may trigger both physiological arousal and subjectively experienced components of anger, sadness, worry, or fear.

In the preceding discussion, it is clear that activity in multiple areas of the brain that are associated with arousal and cognitive control is implicated in children's experience and modulation of emotion. But is the second, bolder claim—that emotional regulatory skills may also affect executive function in ways that might alternately support or constrain learning—also supported by research? Findings from a number of studies with children and adults suggest that it is. For example, individuals' ability to meet the cognitive demands of laboratory-based executive function tasks is alternately promoted or impaired by their management of positive and negative emotions (Lench & Levine, 2005; Schimmack & Derryberry, 2005; see Ursache, Blair, & Raver, 2012 for review). Importantly, these relations are not always linear: At low levels of threat or anxiety, attention may be sharpened, and children may perform better under conditions where emotional cues help to alert and orient them. At high levels of anxiety or threat, however, children's ability to focus their

attention, process and respond to competing information, and use working memory to recall rules or information may be significantly compromised (Blair & Raver, 2012; O'Toole, DeCicco, Hong, & Dennis, 2011). Classic work by Baumeister and colleagues suggests that individuals' awareness of increasing emotional arousal and subsequent efforts to down-regulate negative emotion may significantly impede performance of higher order cognitive tasks, lending support to a resource-depletion model of cognitive and emotional regulation (see, e.g., Johns, Inzlicht, & Shmader, 2008; Schmeichel, Vohs, & Baumeister, 2003).

Put simply, children who have difficulty regulating feelings of anxiety, fear, or anger may be less able to marshal their attention and their cognitive resources to address competing or conflicting cognitive demands when they are in emotionally challenging situations, and may resort to more reactive rather than reflective modes of response. This has major implications for ways that children may have difficulty learning in classrooms that are emotionally negative and chaotic, especially those children who may face higher risk upon school entry. It is to those implications within classroom contexts that this chapter now turns.

Socialization of Emotion Regulation and Implications for Classroom Settings

While early work on children's emotional reactivity and regulation focused extensively on children's early biobehavioral proneness or disposition to distinct styles of emotional responding, more recent work has centered on the ways that their regulatory skills are socialized (see Calkins & Fox, 2002 and Cole et al., 2004 for reviews). Adults have been argued to shape children's regulatory skills through both direct and indirect means, including maintaining emotionally positive, sensitive, and behaviorally contingent styles of engagement. This emotionally responsive style of interaction supports young children's transition from relying on adults to help them down-regulate their distress to demonstrating increasing skills in self-regulation from infancy through toddlerhood (Raver, 1996).

In contrast, chronic experience with adversity, including high levels of parental anger, aggression, and depression, tunes children's reactivity and regulation in both physiological and behavioral domains in ways that compromise children's development of competent emotion-regulation skills (Carpenter et al., 2007; Gunnar & Fisher, 2006). Children's risk of exposure

to higher levels of adult anger, sadness, and withdrawal is substantially increased for the 20% of our nation's youngest citizens who face conditions of chronic poverty and economic hardship. Specifically, families' struggles with income poverty have been consistently found to be related to increased family disruption and conflict between adults, as well as increasing parents' risk of experiencing psychological strain, anger, and depression (Foster & Brooks-Gunn, 2009).

Emerging work at the intersection of social neuroscience and developmental psychology suggests mechanisms through which those experiences of adults' emotional and psychological distress might affect children's emotional regulation. For example, children chronically exposed to adult anger and aggression have been found to develop patterns of self-regulation that are biased in favor of heightened vigilance and responsiveness to emotionally negative stimuli (Hagenaars, Stins, & Roelofs, 2011; Pollak, Vardi, Bechner, & Curtin, 2005). Children exposed to repeated episodes of adult aggression not only experience earlier detection of threat and higher limbic arousal but are less able to down-regulate from exposure to the stressor of other's anger display as quickly as other children (Perlman, Kalish, & Pollak, 2008). Similar findings for young children exposed to both early and recurrent episodes of maternal depression suggest that children in families where caregivers are emotionally detached, withdrawn, and sad face substantially higher risk of developing difficulties in regulating negative emotions (Maughan, Cicchetti, Toth, & Rogosh, 2007). In keeping with "bottom-up" models of self-regulation, emotionally dysregulated adults' and children's consequent hyper- and hypoactive HPA axes functioning in response to both lab-induced and ecologically occurring stressors have been linked to difficulties in optimal cognitive functioning, particularly in working memory tasks and when perceiving and responding to social threats or cues (Dennis & Solomon, 2010; Nater et al., 2007; Roelofs, Bavkis, Hermans, van Pelt, & van Honk, 2007; Schwabe, Bohringer, & Wolf, 2009).

In addition, multiple studies suggest ways that children's emotion regulation is neurochemically "tuned" by exposures to the stressors associated with poverty (Blair et al., 2008; Evans, 2003; Evans & English, 2002; Shonkoff, Boyce, & McEwen, 2009). Increased exposure to interpersonal stressors resulting from parental psychological strain, parental anger, and dysphoria in the home are associated with patterns of physiological reactivity, primarily adrenocortical function (Ackerman & Brown, 2010; Cummings, El-Sheikh, Kouros, & Buckhalt, 2009; Gump et al., 2009; Gunnar, Fisher, & the Early Experience, Stress, and Prevention Science Network, 2006). It is important

to recognize that such an altered regulatory set point may be adaptive within the environment characterized by chronic exposure to psychological distress. Hypervigilance to others' negative emotional cues and the tendency to respond negatively to ambiguous emotional and social situations may aid children with histories of chronic exposure to adult aggression, for example, in detecting and withdrawing from escalating adult anger. But that emotional regulatory style may be maladaptive as children enter new social contexts and interact with new peers and adults in the classroom (Davies, Sturge-Apple, Cicchetti, & Cummings, 2007, 2008; Gunnar & Vasquez, 2001).

How do these findings relate to children's experience in classrooms? One speculation is that classroom settings may serve as socialization contexts that alternately ameliorate or exacerbate emotional regulatory difficulty for those children who face greater biobehavioral and environmental risk. While many of us would wish that all classrooms in which young children are enrolled were well-managed and emotionally positive environments, descriptive findings from large-scale studies of early childhood educational quality suggest that this is not the case. Specifically, in a recent study of 73 kindergarten classrooms in 6 states, the emotional climate of many classrooms fell below moderate levels of quality (using a rough-cut score of 5 on a well-validated observational measure called the CLASS) (La Paro, Pianta, & Stuhlman, 2004). Research suggests that both children and adults contribute to the emotional climate of the classroom, and that teachers may inadvertently exacerbate emotionally negative interactions with children by responding to children's misbehavior in hostile, angry, or emotionally irritable ways (Chang, 2009; Raver, Blair, & Li-Grining, 2012). As teachers become more emotionally negative and more psychologically stressed, they have been found to be less attentive and less able to respond in ways that are contingent or supportive of classroom order, leading teachers to select disciplinary strategies that are largely ineffective (Thijs & Koomen, 2009). In short, in the heat of conflict, adults as well as children are found to become emotionally dysregulated in the classroom context, in ways that may significantly hinder optimal socialization of child self-control and learning.

Importantly for this discussion, these processes may have several significant implications for children's opportunities to learn. First, teachers may simply be able to spend less time on instruction when they experience trouble maintaining order and focused attention in the classroom. Children may also have more trouble attending to cognitively challenging tasks and teachers' instruction when their attention is pulled to peers' misbehavior and emotional distress (see Raver, Blair, & Li-Grining, 2012, for review).

In addition, chaotic classroom contexts may contribute to, rather than ameliorate, children's exposure to chronic stressors. Recent research from child-care studies suggests that the stressful nature of low-quality child care may get "under the skin" of some children, altering their regulatory set points in ways that are empirically similar to emerging findings regarding the role of family emotional climate and children's early HPA axis functioning (see Watamura, Coe, Laudenslager, & Robertson, 2010, for example). In short, settings such as emotionally positive, well-organized classrooms with emotionally responsive and contingent teachers are likely to support children's stress response systems in ways that foster optimal emotional self-regulation and higher-order cognitive control. In contrast, chaotic, emotionally negative classrooms may exacerbate children's risk of less flexible and less optimally tuned stress response systems with higher risk of poorly regulated stress physiology and lower emotional self-regulation (Ursache et al., 2012).

Interventions as an Opportunity to Improve Children's Emotional Development

Developmental models clearly point to the ways that caregivers' provision of emotionally positive, sensitive, and socially contingent care is predictive of young children's higher capacity to down-regulate negative emotion, demonstrate greater positive emotion, and engage in more flexible deployment of the attention processes that aid emotion regulation. Yet, from a more skeptical perspective, we might have the direction of causal inference wrong—that is, prior findings of relations between higher emotion regulation among young children and more emotionally positive, socially contingent care might be because well-regulated children elicit more warm, sensitive care from the key adults in their lives. Fortunately, a series of recent randomized trials has clearly established the ways that changes in caregiving, when experimentally manipulated through early intervention, lead to improvements in young children's attention and modulation of emotion.

Randomized trials of parenting programs have demonstrated this clearly. For example, a a number of recent evaluations of programs [such as the Incredible Years curriculum and the Playing and Learning Strategies (PALS) program] found positive program impacts on parenting behavior and on attention- and behavior-related child outcomes for low-income families (Landry, Smith, & Swank, 2006, Landry, Smith, Swank, & Guttentag, 2008; Webster-Stratton, Reid, & Stoolmiller, 2008).

Cluster-randomized efficacy trials of interventions targeting children's socioemotional skills in classroom settings offer an additional means of directly testing causal questions regarding self-regulation. For example, these interventions in classrooms help to answer the question of whether children's self-regulatory skills are environmentally modifiable over short periods of time. In addition, randomizing some preschool programs and not others to services targeting children's self-regulation allows us to test the causal role of children's emotional and behavioral competence for their academic achievement (see Kellam, Ling, Merisca, Brown, & Ialongo, 1998; and Raver, 2002). In one longitudinal study that my team and I have conducted (CSRP, as it came to be called), we focused exclusively on preschoolers' self-regulation, allowing us to test whether investing in this key, yet less well-understood domain of development would yield academic as well as socioemotional benefit to young children. To test the efficacy of this model, we collaborated with community-based Head Start programs in seven of Chicago's most economically disadvantaged neighborhoods, randomly assigning nine Head Start sites to receive comprehensive intervention services hypothesized to support children's self-regulation. Another nine Head Start sites served as "control group" classrooms.

Our CSRP intervention staff marshaled several primary programmatic components to improve low-income preschool-aged children's self-regulation. These programmatic components included 30 hours of teacher training in classroom management strategies (e.g., rewarding positive behavior, redirecting negative behavior) that were hypothesized to provide children with more effective regulatory support (Webster-Stratton, Reid, & Hammond, 2001; Webster-Stratton et al., 2008). Weekly "coaching" through classroom-based consultation was also provided to teachers as well as stress-reduction workshops for teachers to help limit burnout. Classroom consultants also worked one-on-one with three to five children who exhibited the most challenging behavioral problems.

Our first set of analyses examined whether CSRP made a difference in the emotional climate of the classroom. In completing these analyses, we hoped to address the question of whether emotional regulation at an interpersonal level was improved: That is, did our multicomponent intervention significantly and substantially change the ways that emotions were regulated at the classroom level? Did the tenor of social and emotional exchanges between children, their peers, and their teachers substantially improve? To avoid the risk of measurement bias, we relied on independent observers' ratings of the extent to which teachers were supportive of an

emotionally positive climate and the extent to which teachers resorted to harsh, emotionally negative tactics such as derogation and yelling, using the CLASS (La Paro & Pianta, 2001). Our first set of analyses suggested that teachers in treatment-assigned Head Start sites were successfully able to provide children with significantly more emotionally and behaviorally supportive classroom environments than were teachers in control-group-assigned Head Start sites (Raver et al., 2008). Focal observations of a small subset of randomly selected children within each classroom provided confirmation that the level of conflict between children was also lower in treatment-assigned classrooms, compared to those in the control group. In short, through an emotional regulatory lens, the climate of the classroom could be substantially improved in ways that would make those settings more positive and less stressful, both for children and for adults.

Our second set of analyses suggested that this classroom-based intervention also led to clear reductions in children's emotional and behavioral difficulty (Raver et al., 2009). For example, children in the treatment group were reported by their teachers as having significantly fewer internalizing (or sad and withdrawn) behavior problems than did their control-group-enrolled counterparts by spring of the Head Start year. Children in the treatment group were also reported by their teachers to show significantly fewer externalizing (or aggressive, disruptive, and acting out) behaviors than were children in the control group, in the spring of the Head Start year. In short, the intervention had clear emotional regulatory benefit at the individual level. Our classroom-based multi-component approach substantially improved children's ability to modulate their emotional distress in the "heat of the moment," as rated by teachers.

Most importantly, our third set of analyses provided clear evidence of CSRP's benefit for young children's self-regulation and opportunities for learning. While we found no impact of the intervention on children's expressions of distress or frustration during direct assessments, our analyses confirmed that CSRP improved low-income children's executive function skills from fall to spring of the Head Start year. Analyses also suggested significant benefits of CSRP for children's preacademic skills, as measured by direct assessments of children's vocabulary, letter-naming, and math skills (Raver et al., 2011). From a policy perspective, these findings provided clear support for specific steps that programs might take to improve school readiness by focusing on the emotional climate of the classroom and positive ways to support children's emotional and behavioral regulation. From a scientific perspective, these findings also provided us with persuasive evidence

that children's self-regulation is environmentally modifiable. When targeted through classroom-based intervention, changes in self-regulation also lead to socioemotional and academic gains for children facing high poverty-related risk. These findings from CSRP are in keeping with several other recent trials suggesting the modifiability of children's self-regulation in class-room contexts. New evidence from several recently implemented preschool interventions is promising. For example, low-income preschool-aged children receiving the comprehensive preschool REDI intervention designed to improve their socioemotional and preacademic skills were found to demonstrate stronger levels of self-regulation on a direct assessment of attention and impulsivity at post-test, compared to low-income preschoolers in the control group (Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008).

Looking Ahead: Emotion Regulation in the Context of Elementary School

As we learned through our own research, children inevitably leave preschool (and the early interventions that we so carefully craft) for a larger, more complex setting: elementary school. Yet the research on schools as emotionally supportive or emotionally dysregulating is nascent. Emerging, innovative research suggests that schools may be powerful ecological contexts where chronic exposure to chaotic, unsafe, and poorly supervised classrooms, hallways, cafeterias, playgrounds, and stairwells may be highly stressful and costly to children's trajectories of emotional regulation (Gottfredson & Gottfredson, 2001; Jones, Brown, & Lawrence Aber, 2011; Roeser, Eccles, & Sameroff, 2000). Those risks to the development of optimal emotional regulation are likely to be even higher for low-income children, who face higher probability of attending schools that are crowded, unsafe, and highly disorganized (Reardon, Yun, & Eitle, 2000).

In addition, we have most often considered schools for their academic quality, characterizing them along dimensions of school-level achievement (indicated by the proportion of students passing third-grade standardized achievement tests, for example). Yet it may be important to understanding both parents' and students' own preferences and motivations for attending school to also focus on schools' provision of emotional and social support. Schools can also be characterized by the extent to which they are perceived as violent or unsafe and by ways that the adults in the school may be viewed as relatively unsupportive or uncaring (Lippman, Burns, & MacArthur, 1996).

These factors may powerfully shape children's daily experiences in their schools. For example, adults' supportiveness for students has been found to dramatically reduce students' risk of such stressful victimization experiences as being physically attacked or threatened with a weapon or having their belongings stolen (Gottfredson & DiPietro, 2011).

Recent findings suggest that exposure to chronically high levels of negative social interaction (including violence) and lower levels of support are robustly associated with increases in biomarkers of individuals' increased allostatic load (Murali & Chen, 2005; Ross, Martin, Chen, & Miller, 2011). In light of these findings, exposure to school as a chronically unsafe and emotionally unsupportive context may be especially stressful to low-income children, at both neuroendocrine as well as psychological levels. In support of this hypothesis, recent findings suggest that student perceptions of more negative school climate, lower levels of order and lower levels of discipline were associated with a higher probability of greater behavioral problems, over time (Wang, Selman, Dishion, & Stormshak, 2010).

Recent analyses suggest that elementary schools can be characterized along these multiple dimensions of school quality in ways that are well aligned with the measurement of stressful versus supportive climates in middle and high schools (Lowenstein, Wolf, Aber, Raver, & Gershoff, 2013; see also Cook, Gottfredson, & Na, 2010; Wang et al., 2010). Using publically available surveys of the school experiences of children in Chicago public schools, for example, we have found that elementary schools in Chicago can also be coded along these multiple dimensions of school quality, including students' experiences of schools as safe versus unsafe (where children report low vs. high experiences of bullying, and the desire to attend a different school) and where students report low versus high levels of adult support for their emotional and learning needs (Lowenstein et al., 2010). This is an important new direction for our work, as we continue to examine ways that neighborhood and school quality may contribute to CSRP children's emotional and behavioral regulation over time (Sharkey, Tirado-Strayer, Pappadopolous, & Raver, in press).

Summary and Implications

Though speculative, the hypothesis that the emotional climate of multiple ecologies, including homes, neighborhoods, and schools may affect children's emotional regulation at neuroendocrine and behavioral levels

offers promising new directions for developmental and educational research. It helps us to understand ways that multiple poverty-related stressors may "get under the skin," shaping or canalizing children's opportunities for learning at the neurocognitive level (see Blair & Raver, 2012 for more extensive discussion). Applied to educational contexts, it helps us to understand ways that classrooms may alternately foster or deflect children's trajectories of self-regulation. Stated differently, there may be neurobiological as well as psychological mechanisms that lead emotionally positive school climates to help some children in developing the executive function skills and emotional competence that allows them to experience school and learning in positive ways. In contrast, other schools may be aversive, stressful contexts for children, placing them at higher risk of withdrawal and detachment as well as difficulties maintaining reflective rather than more reactive styles of executive function. This chapter has highlighted the ways that these processes may be particularly important for children facing substantial poverty-related risk with evidence of several ways that educational settings serving low-income children can improve their chances of school success through classroom-based intervention.

In conclusion, this chapter offers evidence from multiple areas of developmental, neuroscientific, and educational research to suggest the benefits of viewing educational processes through the lens of emotional regulation. Rather than being placed in opposition, basic research in neuroscience suggests instead that there is tremendous intellectual benefit to consideration of cognitive and emotional domains of self-regulation as integrated at both neurological and behavioral levels (see Dennis & Chen, 2007). We now face tremendous opportunities to reap those benefits through carefully designed school-based interventions that can answer key scientific and policy questions in the years ahead.

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4

Early Math and Literacy Skills
Key Predictors of Later School Success

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Children enter school with a set of cognitive skills and socioemotional behaviors determined by interactions between their own endowments and the quality of their early family and child-care experiences (Shonkoff & Phillips, 2000). These skills and behaviors are building blocks for the acquisition of later, more sophisticated skills (Knudsen, Heckman, Cameron, & Shonkoff, 2006). But they also shape children's environments, particularly interactions with teachers and classmates, school experiences such as placement into ability groups, and interactions with family members. These environments can exert their own independent effects on children's learning and skill development throughout the school years.

Discussions of preschool "quality" reveal little consensus regarding the relative importance of cognitive skills versus socioemotional behaviors for school readiness (Zigler, Gilliam, & Barnett, 2011). The National Research Council's Committee on the Prevention of Reading Difficulties in Young Children recommends providing environments that promote preliteracy skills for all preschool children (Snow, Burns, & Griffin, 1998). The National

Association for the Education of Young Children and the National Council of Teachers of Mathematics (2002) issued a joint statement that advocated for high-quality mathematics education for preschool children.

Others, however, maintain that a broader constellation of behaviors and skills enables children to learn in school. Asked to identify factors associated with a difficult transition to school, kindergarten teachers frequently mentioned problems with social skills, trouble following directions, and difficulty with independent and group work (Rimm-Kaufman, Pianta, & Cox, 2000). The book *From neurons to neighborhoods* argued that "the elements of early intervention programs that enhance social and emotional development are just as important as the components that enhance linguistic and cognitive competence" (Shonkoff & Phillips, 2000, pp. 398–399).

Our chapter describes the cumulative nature of literacy and math learning and summarizes evidence showing that future school achievement is much less a function of a child's school-entry social and emotional development than his or her concrete literacy and numeracy skills. The picture changes when the conception of school "success" is expanded to include not only doing well on achievement tests, but also completing high school and attending college. No measure taken at the point of school entry has powerful associations with these attainment outcomes. More consequential is whether persistent learning or behavior problems were evident in elementary school. Avoiding persistently low math achievement mattered the most for positive school attainment.

Reading and Math Skills

For preschoolers making the transition to primary school, reading-related skills encompass identification of upper- and lowercase letters as well as decoding skills such as beginning to associate sounds with letters at the beginning and end of words (Snow et al., 1998). Most early reading problems reflect poor decoding skills and low levels of phonological and phonemic awareness, such as a poor ability to break down words into component sounds. Basic oral language skills become critical for understanding texts as the level of difficulty of reading passages increases (NICHD Early Child Care Research Network, 2005; Scarborough, 2001; Snow et al, 1998; Whitehurst & Lonigan, 1998).

As children progress through childhood, the kinds of texts that they encounter in schools change, such that strong word-level identification skills are no longer sufficient to ensure comprehension of increasingly complicated texts (Chall, 1983). At each grade level, higher order vocabulary and language skills explain increasingly more variation between strong and weak readers (Snow, Porche, Tabors, & Harris, 2007). By the end of elementary school, students are developing reading comprehension and evaluation skills, which include identifying the main points in a passage as well as understanding an author's intentions and evaluating the adequacy and logical consistency of supporting evidence—skills persistently elicited while reading domain- or content-specific academic genres (Shanahan & Shanahan, 2008).

Rudimentary math skills can be detected in children within the first 6 months of infancy, including sensitivity to the number of objects, movements, and sounds presented and the ability to perform simple calculations (Winn, 1998). Concrete math skills begin with the ability to recognize numbers and shapes and compare relative sizes (Cross, Woods, & Schweingruber, 2009). Counting and sequencing skills are followed by the ability to understand number relationships and perform mathematical operations with numbers, including addition and subtraction tasks as well as multiplication and division tasks. Understanding numerical properties such as proportions, fractions, integers, and decimals also develops, as do measurement skills and an understanding of geometry. A strong foundation of basic number concepts such as one, two, and three dimensions becomes increasingly important as children advance from basic computational tasks to more complex mathematical problems that require flexible problem-solving techniques (Baroody, 2003).

Advanced mathematics courses require children to take principles they have learned about numbers and apply operations to abstract mathematical objects including vectors, rotations, and sets. Thus, mathematics instruction continually builds upon earlier skills, yet presents new challenges and levels of abstraction that are qualitatively different than those acquired at earlier ages. These pre-academic and academic skills develop as a result of learning opportunities embedded in everyday activities and specific instruction. Achievement gains are largest in the early years of school, as children quickly learn many new skills and improve existing ones (see Figure 4.1). Although learning continues into later school years, the rate of gaining new skills declines over time as more focus is placed on elaborating and improving existing skills.
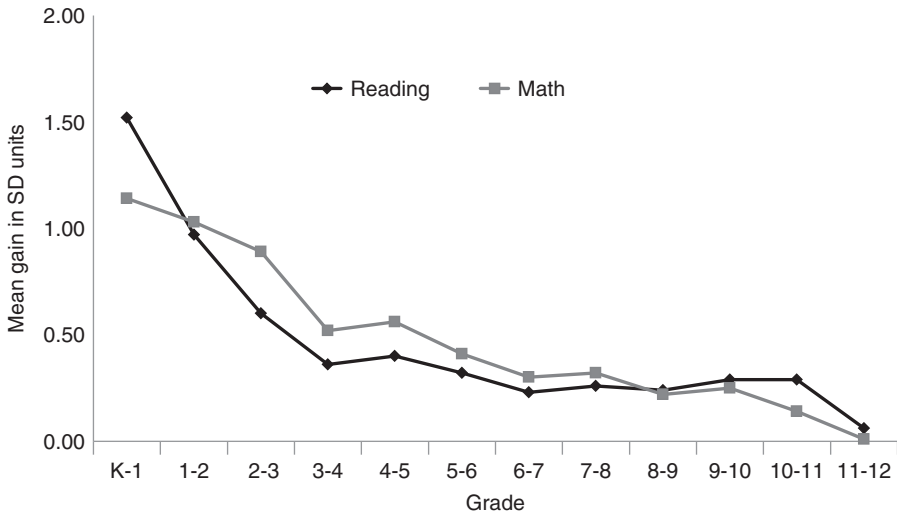
Figure 4.1. Average Annual Gain in Math and Reading Achievement across Grades. Adapted from Hill, Bloom, Black, & Lipsey (2008).

Correlations and Gaps

Children's academic achievement demonstrates both transitory fluctuations and, less frequently, fundamental trajectory shifts (Kowaleski-Jones & Duncan, 1999; Pungello, Kupersmidt, Burchinal, & Patterson, 1996). Stevenson and Newman (1986) showed persistent association between basic skills in math and literacy such as number and letter recognition and children's later achievement test scores. In their meta-analysis, La Paro and Pianta (2000) find middle-range correlations in cognitive/academic skills between preschool and kindergarten (.43) and between kindergarten and first or second grade (.48). Duncan and Magnuson (2011) provide useful correlational information on reading and math achievement in elementary school. Their data are drawn from the Early Childhood Longitudinal Survey Kindergarten Cohort of 1998 (ECLS-K), a large and representative national sample of kindergartners who are followed through eighth grade. Duncan and Magnuson (2011) show that the temporal correlations between kindergarten and later grades are .6 or higher for both reading and math achievement, even through fifth grade.

Duncan and Magnuson also show association among academic skills at various points in elementary school. For comparative purposes, they also
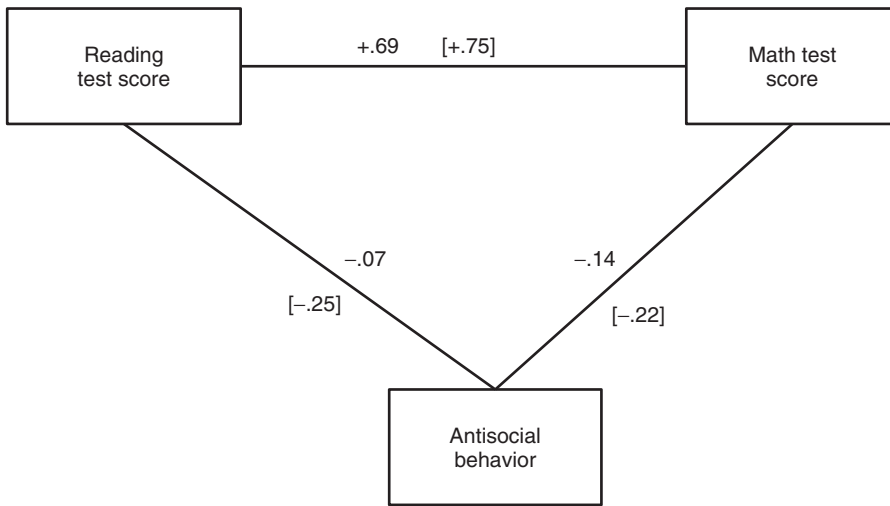
Figure 4.2. Kindergarten and Fifth-Grade Correlations among Math and Reading Achievement and Antisocial Behavior. Fifth-grade correlations are shown in brackets. Adapted from Duncan and Magnuson (2011), Table 3.A1, based on teacher reports in the ECLS-K.

include a measure of externalizing behaviors which consists of teacher reports of the frequency with which a child argues, fights, gets angry, acts impulsively, and disturbs ongoing activities. Kindergarten and fifth grade correlations among these three measures are shown in Figure 4.2. Not surprisingly, kindergarten reading and math achievement have the highest correlation (+.69), while antisocial behavior has a modest negative correlation with both the achievement measures. By fifth grade, correlations between the two achievement and antisocial behavior measures have grown substantially. This suggests that the early school years are a time in which children become more differentiated into groups with higher achievement and (teachers' perceptions of) good behaviors and with lower achievement and more antisocial behavior.

Figure 4.3 plots differences in reading scores across socioeconomic, racial/ethnic, and gender groups in both kindergarten and fifth grade.[1] SES gaps far exceed racial/ethnic and gender gaps. On average, students in the bottom SES quintile scored well over one standard deviation below children in the top SES quintile. Moreover, the SES gap was larger in fifth grade than in kindergarten. Reading skills gaps with Whites are broadly similar for Blacks and Hispanics, although they increase much more for Blacks than
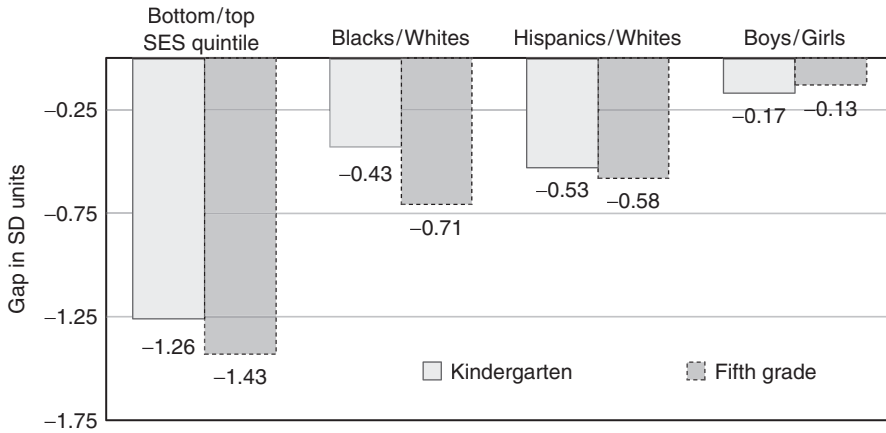
Figure 4.3. Reading Gaps in Kindergarten and Fifth Grade. Negative numbers indicate that the first listed group has lower scores, on average, than the second listed group. Adapted from Duncan and Magnuson (2011), Tables 3.A5 and 3.A6.

Hispanics between kindergarten and fifth grade. Math achievement gaps also grow sharply for Blacks (from .62 to .85 standard deviations; data not shown) but fall (from .77 to .50 standard deviations; data not shown) for Hispanics relative to Whites.

Early Skills and Later Achievement

Few studies examining the links between school-entry academic skills and behaviors and later achievement control adequately for potential confounders. One exception is Duncan et al. (2007), which identifies six population-based data sets containing measures of reading and math achievement, attention skills, prosocial behavior, and antisocial and internalizing behavior problems, all taken around the time of school entry. Moreover, all studies measured reading and math achievement later in the elementary- or middle-school years. Most of the achievement outcomes came from tests administered between first and eighth grade, although results were similar when they used teacher-reported achievement data. Most of the school-entry reports of socioemotional behaviors were provided by teachers; the rest came from parents. School-entry reading and math skills were measured using tests. One of the data sets provided a computer-based test of attention skills; the rest relied on teacher and parent reports.

Table 4.1.   Effect Sizes of School-Entry Skills and Behaviors on Later Achievement. Meta-analysis of 236 coefficients. Adapted from Duncan et al. (2007).

	Grades 1 to 8	
School-entry	**Math achievement**	**Reading achievement**
Reading	.09*	.24*
Math	.41*	.26*
Attention	.10*	.08*
Externalizing (−expected)	.01 ns	.01 ns
Internalizing (−expected)	.01 ns	−.01 ns
Social skills	−.00 ns	−.01 ns

Note: *p < .05; ns, not significant; n=236 estimated coefficients. Estimates control for time to test, test/teacher outcome, study fixed effects; coefficients are weighted by inverse of their variances.

Using this data, measures of later reading and mathematics achievement were regressed on kindergarten-entry measures of reading and math achievement, attention, externalizing and internalizing behavior problems. The most complete models controlled for the child's cognitive skills, behavior, and temperament measured prior to the point of kindergarten entry as well as for family background factors. To establish comparability across studies, all achievement and behavior measures were standardized. All post-kindergarten reading and math achievement outcome measures available in the six data sets were treated as dependent variables in separate regressions.

Average effect sizes from the regressions involving math and reading outcomes are presented in Table 4.1. The ".09" and ".24" numbers in the first row indicate that—controlling for prior IQ, family background, and concurrent attention skills and behaviors—a one-standard-deviation increase in school-entry reading skills is associated with a .09-standard-deviation increase in later math achievement and nearly a quarter-standard-deviation increase in later reading achievement. Both of these estimates of average effects are statistically significant.

A broader look at the results in Table 4.1 reveals that only three of the six sets of school-entry skill and behavior measures are predictive of subsequent school achievement: reading, math, and attention, with early math skills being consistently most predictive. Externalizing and internalizing behavior problems and social skills were not associated with later achievement in models in which achievement and child and family characteristics were held constant. Indeed, none had a standardized coefficient that averaged more

than .01 in absolute value. These patterns generally held within each of the six data sets that were examined.

Not surprisingly, reading skills were stronger predictors of later reading achievement than of later math achievement. Less expected was that early math skills (adjusting for prior cognitive skills in five of the six studies) were as predictive of later reading achievement as early reading skills. Children's attention skills appeared to be equally important (and several dimensions of socioemotional behaviors uniformly unimportant) for reading and math achievement.[2]

Foster (2010) organized a special section in *Developmental Psychology* devoted to replications and extensions of the Duncan et al. (2007) analysis. Table 4.2 provides a summary of findings from the articles that assessed the predictive power of both academic skills and socioemotional behaviors. In two cases, new data sets were analyzed; others introduced new measures or moderators into the analysis. In the case of the two new data sets, early math measures again proved to be more consistently predictive of later achievement, while socioemotional measures were consistently unpredictive of these outcomes. In the four data sets where they were available, fine motor skills proved independently predictive of later achievement.

All in all, both the Duncan et al. (2007) analysis and Foster (2010) replications provide a clear answer to one question about the relative role of school-entry skills and behavior. For later school *achievement*, early academic skills appear to be the strongest predictor, even after adjusting for differences due to the fact that early achievers score higher on tests of cognitive ability and come from more advantaged families. Early math skills are more consistently predictive of later achievement than early reading skills. A student's school-entry ability to pay attention and stay on task is modestly predictive of later achievement, while early problem behavior and other dimensions of social skills and mental health problems are not at all predictive.[3] If school readiness is defined as the skills and behaviors that best predict later academic achievement, concrete numeracy and literacy skills are decidedly more important than socioemotional behaviors.

Early Skills, High-School Completion, and College Attendance

It is far from clear whether early academic skills matter as much and early behaviors as little for adolescent and early-adult school attainment as they do

Table 4.2. Results from Replication Studies of the Predictive Power of Early Academic Skills.

Reference	Focus	Data sets	Results
Pagani et al. (2010)	Replication and extension (adding motor skills) using new data set	QLSCD	Math and attention measures were most predictive of later achievement; receptive vocabulary and fine motor measures next most predictive; socioemotional behaviors were generally unpredictive
Romano et al. (2010)	Replication and extension (adding motor skills) using new data set	NLSCY	Math measures most predictive, followed by reading and attention behavior; socioemotional behaviors were generally unpredictive
Grissmer et al. (2010)	Replication and extension (adding motor skills and general knowledge)	ECLS-K; NLSY and BCS	Math measures were most predictive of later achievement; reading and attention measures next most predictive; fine motor measures were consistently predictive; general knowledge also predictive
Hooper et al. (2010)	Replication on separate samples of African American and Caucasian children	SECCYD and ECLS-K	Early reading, expressive language and math measures were consistently predictive of later achievement; some evidence that externalizing and internalizing problem behaviors mattered for African American students

Note: QLSCD is the Quebec Longitudinal Study of Child Development; NLSCY is the (Canadian) National Longitudinal Survey of Children and Youth; ECLS-K is Early Childhood Longitudinal Study – Kindergarten Cohort; NLSY is the National Longitudinal Survey of Youth; BCS is the British Cohort Study; SECCYD is the Study of Early Child Care and Youth Development.

for middle-childhood reading and math achievement. Finishing high school likely requires a combination of achievement, engagement, and perseverance. Antisocial behaviors in primary school may lead only to inconsequential trips to the principal's office, while such behaviors in middle or high school may result in suspension, expulsion, or even criminal prosecution.

Hernandez (2011) analyzes reading and high-school completion data from the National Longitudinal Study of Youth—Child Supplement (NLSY), which tracks cohorts of children from birth into adulthood. When he defines "below basic" third-grade reading achievement as being in the bottom third of the reading achievement distribution, he finds that some 16% of "below basic" children fail to graduate from high school by age 19, a rate four times higher than for those with higher reading scores.

Duncan and Magnuson (2011) also use NLSY data to study longitudinal linkages to high-school completion, in their case with both school-entry and persistent academic and behavior problems during primary school. They find that school-entry math and reading test scores had small, negative effects on high-school dropout that were at best at the margin of statistical significance.

More powerful relationships between some of these skills and educational attainment emerged during the school years themselves. In their most revealing analysis, Duncan and Magnuson (2011) assessed the importance of *persistent* academic problems for high-school completion and college attendance. To do this, they categorized children according to their pattern of scores for reading and math achievement during the early school years (age 6, 8, 10). The 25th percentile was chosen as the upper limit for low achievement.

They then formed three groups—*never*, *intermittent*, and *persistent*—depending on whether the child fell into the worst quarter of a given measure's distribution on zero, one or two, or all three measurement occasions. Like Hernandez (2011), they find a powerful simple association between reading problems and high-school graduation. Children persistently scoring in the bottom quartile of the reading distribution were 32 percentage points less likely than children in higher quartiles to graduate from high school and 36 percentage points less likely to attend college. But similar bivariate patterns were found for persistent math problems, which were associated with 32 and 44 percentage-point reductions in high-school graduation and college attendance.

These powerful simple associations tell us little about what might happen if we were to improve the reading skills of a child with persistent reading problems in elementary schooling. For that we need more of a causal analysis
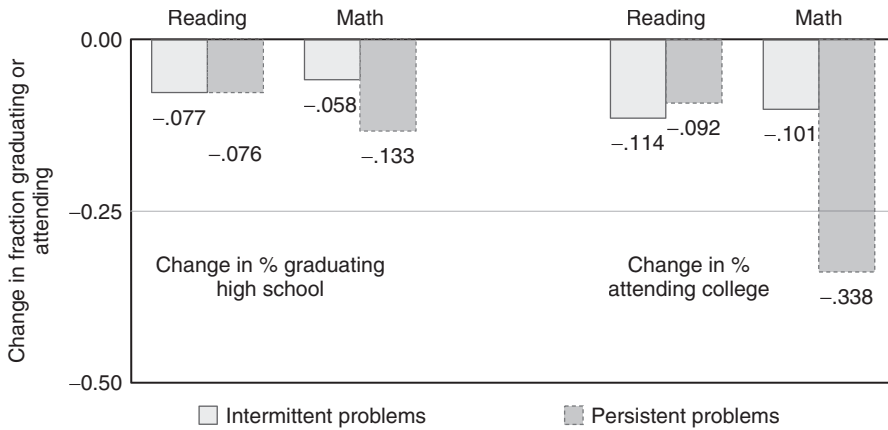
Figure 4.4. Effect of Intermittent and Persistent Reading and Math Problems on the Probabilities of High-School Graduation and College Attendance. "Persistent problems" means that the child scored in the bottom 25% of the achievement distribution at ages 6, 8, and 10 and is compared with children who were never in the bottom 25% at these ages. "Intermittent problems" means that the child scored in the bottom 25% of the achievement distribution once or twice at ages 6, 8, and 10. All results control for child IQ and family background as well as concurrent problems in other areas. Adapted from Duncan and Magnuson (2011), Table 3.A1.

that takes into account the fact that struggling readers tend to come from disadvantaged families, have problems in other academic areas, and are more likely to exhibit behavior problems. Maybe these differences, rather than reading differences, are what really matters for a struggling reader.

Figure 4.4 shows differences in the probabilities of graduating from high school and attending college for children with intermittent or persistent reading and math problems after controlling for differences in child IQ and family background as well as concurrent problems in other areas. All groups of children with intermittent or persistent problems are compared with children who *never* were in the bottom 25% of the reading or math distributions in elementary school.

Intermittent problems in both math and reading are associated with 6–8 percentage point reductions in high-school graduation and about 10 percentage point reductions in college attendance. All of these differences are significant at either the 10% or 5% levels of statistical significance.

Surprisingly, children with persistent early reading problems differed little from children with intermittent reading problems in terms of these two

attainment outcomes. In contrast, children with persistent math problems were considerably less likely to graduate from high school and much less likely to attend college. The "−.338" number means that the chances of attending college for a child with persistently low math achievement were 33.8 percentage points lower than for children with no math achievement problems. By this accounting, serious and persistent math problems in elementary school appear far more consequential for later attainment than reading problems.

Why Math More than Reading?

We know very little about the mechanism behind links between early math skills and later achievement and attainment. One possible set of mediators are a child's engagement in and motivation for school. More so than for reading, children's experiences with the math they are taught often come in the form of graded worksheets, with right and wrong answers clearly identified. Parents and children might use this information to make judgments about the child's ability and then form high or low expectations regarding math performance (Aunola, Nurmi, Lerkkanen, & Rasku-Puttonen, 2003).

In the early school grades, children believe that their skills are highly malleable, yet sometime between second and fourth grades children begin to show a stronger belief in the temporal consistency of ability (Droege & Stipek, 1993; Freedman-Doana et al., 2000). Older children begin to attribute high scores to ability but consider low scores a result of insufficient effort (Pomerantz & Saxon, 2001). Therefore, high scorers who experience subsequent challenges might increase their effort, while those with consistently low scores may eventually give up. This, in turn, could affect general engagement and subsequent success in school.

A second route is with teachers and school structures. Children with precocious math skills might be favored by teachers, assigned to gifted or talented services, or, at the lower end of achievement, kept out of special education tracks (Hibel, Farkas, & Morgan, 2010). These decisions, in turn, might keep children ahead of grade in what they are learning or at least prevent them from falling behind.

Another factor may be related to the state of research and training for teachers related to literacy interventions relative to numeracy remediation. Perhaps late-identified struggling readers receive targeted intervention for discrete reading skills they need, whereas similarly robust interventions are not available for struggling math students. This explanation is aligned with

one that sees higher continuity with the skills needed in math classes than in the skills needed for reading excellence. In particular, it might be that, although discrete word-level skills are essential for reading development and explain differences between readers in early grades, these skills can be effectively remediated and, furthermore, they are not necessarily associated with students' higher order reasoning or vocabulary abilities. In contrast, although basic mathematical concepts are established in the elementary school years, students continue to face challenging shifts in mathematics skills, concepts, and conceptual frameworks as they move from algebra to geometry, and geometry to calculus in secondary school. An effective intervention, therefore, must not only tackle effective problem-solving techniques but also foster a deep understanding and internalization of mathematical operations and principles (Hiebert & Wearne, 1996).

Lastly, these findings may be connected to the systemic importance of literacy in all content areas at the secondary level. Students and teachers may be able to avoid addressing serious problems in math until they become nearly insurmountable. Serious literacy problems, on the other hand, are almost impossible to ignore in the secondary context in which content area classes revolve around textbooks and disciplinary reading.

Summary and Implications for Early Childhood Interventions

Recent evidence suggests that future school achievement is much less a function of a child's school-entry social and emotional development than of concrete literacy and numeracy skills like knowing letters, word sounds, numbers, and ordinality. Ability to pay attention and engage in school tasks occupies an intermediate position—consistently predicting future achievement, but not as powerfully as early reading and, especially, math skills.

Expanding our conception of school "success" to include not only doing well on achievement tests, but also completing high school and attending college changes the picture somewhat. School-entry achievement was only very modestly predictive of these outcomes. More consequential was whether persistent learning problems were evident in primary school. Avoiding persistently low math achievement mattered the most for positive school attainment.

It is hazardous to draw policy implications from nonexperimental studies. The estimates of the causal influence of early skills and behaviors may be biased. Even if unbiased, estimates of what is most important may point to skills or behaviors that are impossible or very costly to modify. The appropriate intervention policy test involves costs and benefits rather than correlations. Fortunately, quite a number of targeted preschool curricula have successfully boosted early math, literacy, attention, and behavior skills. Based on the nonexperimental evidence, the best bets for promoting later school achievement would appear to be proven preschool math and literacy curricula, while longer run educational attainments are most likely to be influenced by curricula or other programs that ensure that children avoid persistent achievement and externalizing behavior problems in primary school.

Policy actions should not be based on "best bets," however, but rather on convincing evidence from rigorous evaluations of scalable programs. Here the biggest problems are that evaluations of seemingly successful curriculum intervention programs rarely continue for more than a few months after the intervention is completed and outcomes other than those targeted by the intervention are rarely measured. "Cross-over" impacts of, say, improving attention skills on math or reading achievement are rarely estimated. Nor are follow-ups long enough to estimate impacts on general education attainment outcomes such as school dropout or college attendance. Sorely needed are longer run follow-ups that measure impacts on a diverse set of skills and behaviors, school attainment, and economically significant school outcomes such as special education placement, grade failure, school suspensions, criminal arrests, and incarcerations.

One of our noteworthy results is that early math skills are the most powerful predictor of later achievement. It is important to discover why. Math is a combination of both conceptual and procedural competencies such as working memory; however, our data does not allow us to examine these competencies separately. Still, our findings provide compelling evidence that future research should be devoted to a close examination of efforts to improve math skills prior to school entry. Random-assignment evaluations of early math programs that focus on the development of particular mathematical skills and track children's reading and math performance throughout the elementary- and secondary-school years could help to identify missing causal links between early skills and later achievement.

Acknowledgments

Notes

1. Duncan and Magnuson (2011) find broadly similar patterns of achievement gaps for math and reading.
2. These results were robust to a host of potential problems: (a) adjustments for error in measuring attention and socioemotional skills had little impact on the results; (b) maternal reports of attention and behavior were nearly as predictive as teacher reports of later academic achievement; (c) worries proved unfounded that the models may overcontrol for achievement-related impacts of attention and socioemotional skills; (d) bias from shared-method variance was not a concern because test scores were just as predictive of later teacher-reported as test-based achievement measures; (e) the relative importance of school-entry factors was similar for immediate (e.g., first-grade) and later (e.g., fifth-grade) measures of achievement; and (f) impacts of behavior problems were no larger for entering students with the most problems.
3. It is important to note that the Duncan et al. (2007) analysis was of population-based data sets that provided little to no ability to identify children with diagnosed conduct disorder, attention deficit, or other behavioral conditions. It is best to think of their analyses as focusing on children with relatively high or low, but not clinical, levels of learning, attention, and behavior problems.

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5

Children's Intrinsic Motivation to Learn

Does It Decline over Time and, If So, Why?

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Introduction

Schooldays are an important and challenging time for children. They have to make new friends, will experience success and failure, will be proud and disappointed, and some of them will struggle with challenging tasks and the increasing demands that are placed upon them. As children spend a good portion of their daily life at school, experiences in this context presumably have far-reaching consequences not only for their academic development but also for their general wellbeing. Besides general intelligence, students' intrinsic motivation is commonly regarded as one of the main determinants of academic achievement, engagement, and school functioning in general (see, e.g., Eccles, Wigfield, & Schiefele, 1998; Simpkins, Davis-Kean, & Eccles, 2006). Accordingly, to meet the demands required to be successful at school and to be well equipped for lifelong learning, individuals need high and sustainable motivation to learn. Recent research, however, has consistently documented that important prerequisites for learning, such as intrinsic motivation for school-related learning, diminish over time (Chouinard & Roy, 2008; Gottfried, 1990; Gottfried, Fleming, & Gottfried, 2001; Spinath & Spinath, 2005; Spinath & Steinmayr, 2008).

This chapter addresses the issue of children's declining intrinsic motivation and discusses some reasons that might be responsible for this development. We start by defining the concept of intrinsic motivation and pointing out its relevance in various situations, before giving an overview of empirical studies that have investigated different factors potentially influencing the development of students' intrinsic motivation over the elementary-school years.

Defining the Concept of Intrinsic Motivation

The concept of intrinsic motivation plays a central role in different motivation theories (Ryan & Deci, 2000; Wigfield & Eccles, 2000). In this chapter, we focus on the concept of intrinsic task values as included in the expectancy-value theory of motivation by Eccles and her associates (cf. Wigfield & Eccles, 2000). Intrinsic motivation, in other words, is defined as the degree of positive affective evaluation of an activity (i.e., liking and enjoyment) for reasons that lie within the activity itself rather than in its consequences (Eccles, Wigfield, & Schiefele, 1998; Ryan & Deci, 2000; Wigfield & Eccles, 1992). Though different researchers define intrinsic motivation slightly differently (see, e.g., Murphy & Alexander, 2000), this definition provides a shared commonality among most of them.

Although intrinsic task values are not the only reason for learning, task enjoyment can be considered as the most desirable state for learners because learning comes as a by-product of engaging in a pleasurable activity. Therefore, intrinsic motivation can be considered to be an end of education in itself. Moreover, it has been shown that intrinsic task values are the most important reasons for task engagement in elementary-school children who do not yet differentiate other task values such as utility or importance (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Wigfield & Eccles, 1992).

Intrinsic motivation is typically assessed via self-reports that ask the reporter to indicate the degree of liking, enjoyment, or interest in a task. In the school context, intrinsic motivation can be assessed domain-specifically or on a more general level with regard to school in general (see also Table 5.1).

The Relevance of Intrinsic Motivation for School Functioning

Intrinsic motivation has been shown to be positively related to a number of desirable outcome variables that concern academic learning and success. For

Table 5.1. Example Items for Measuring Elementary-School Students' Intrinsic Motivation in Math, German, and School in General (Spinath & Steinmayr, 2008).

Subject area	Example item
Math	How much do you like mental arithmetic?
German	How much do you like writing stories and letters?
School in general	How much do you like the things you do at school?

example, it has been reported that intrinsically motivated students show more persistence and engagement (Otis, Grouzet, & Pelletier, 2005) and a higher degree of task involvement (Brophy, 1983). Further positive correlates have been found for mastery orientation (Harackiewicz & Elliot, 1993), curiosity (Berlyne, 1971), creativity (Amabile, 1996), and a preference for challenging, difficult, and novel tasks (Gottfried, 1990), not forgetting its positive relation to academic achievement (Boggiano, 1998; Lepper, Corpus, & Iyengar, 2005). It is a logical consequence that children who seek challenges, are curious about and interested in their school work, and have the desire to master their tasks, also perform better at school (Lepper, Corpus, & Iyengar, 2005). Bearing in mind all these positive associations, it appears self-evident to study the underlying mechanisms of intrinsic motivation in order to find ways to sustain or reactivate the initially high motivation of young children.

Development of Children's Intrinsic Motivation

Much prior research has been devoted to establishing characteristic mean level changes in school-related intrinsic motivation across school trajectories. On the basis of this research, it is well known that, at the beginning of schooling, students are generally eager and excited to learn new things, but that their intrinsic motivation to learn and master their school subjects diminishes over the school years (Gottfried, 1990; Gottfried, Fleming, & Gottfried, 2001; Spinath & Spinath, 2005; Spinath & Steinmayr, 2008). This general downward trend in the mean level of students' intrinsic motivation typically starts at the age of eight or nine and does not stop before the age of 16. At the age of 16, the negative development typically stagnates, and afterwards an actual increase in intrinsic motivation can be observed in some disciplines

(Fredricks & Eccles, 2002; Gottfried, Fleming, & Gottfried, 2001; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Spinath & Steinmayr, 2012; Watt, 2004).

As part of the Fullerton Longitudinal Study, Gottfried, Fleming, and Gottfried (2001), for example, examined the development of students' intrinsic motivation in math, science, reading, social studies, and school in general in a sample of $N = 96$ 9- to 17-year-olds. The CAIMI (Children's Academic Intrinsic Motivation Inventory; Gottfried, 1986) was administered at five measuring points (ages 9, 10, 13, 16, and 17) to assess students' academic intrinsic motivation. Results showed linear downward trends for school in general and all the measured domains except social science, indicating that academic intrinsic motivation might be related to the school curriculum (see Figure 5.1). The largest developmental decline occurred for math. The authors named several reasons for this derogating development of math: First, students typically perceive math as being harder than other subjects (Stodolsky, 1988). Second, math teachers report less autonomy with regard to course content compared to social science teachers generally, and, perhaps, may transfer their feelings of a lack of autonomy to their students (Stodolsky & Grossman, 1995). Finally, Stodolsky (1988) was able to show that, when students are learning social sciences, different paths lead
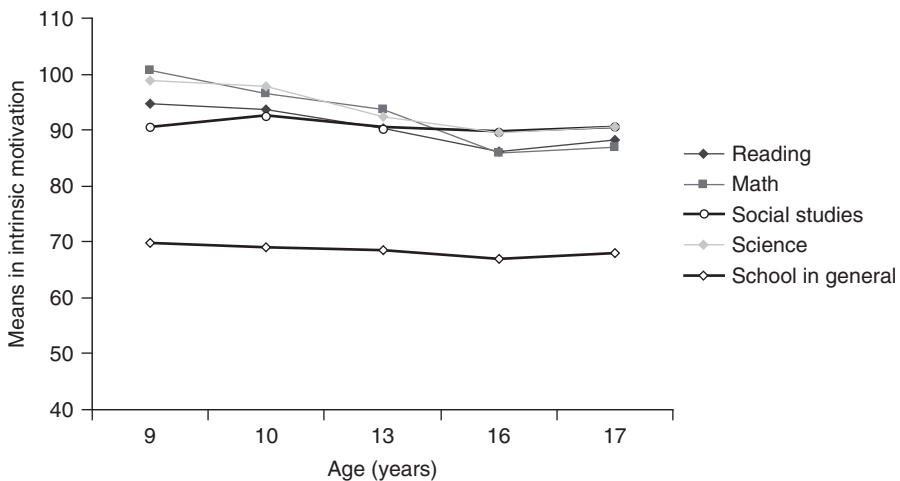
Figure 5.1. Development of Students' Intrinsic Motivation for Reading, Math, Social Studies, Science, and School in General. Based on data from Gottfried, Fleming, and Gottfried (2001; see Table 2 on p. 9). Note: The maximum level that can be achieved is 122.

to success, while learning math is usually guided by the teacher. This, again, could lead to lower autonomy perceptions on the part of students.

Another study that investigated the development of students' intrinsic motivation was conducted by Spinath and Steinmayr (2008). A sample of $N = 670$ third-grade students was followed for over 1 year and delivered self-reports on intrinsic motivation in math, German, and school in general. Data was collected on four measurement occasions with an interval of 3 months between each test administration. Intrinsic values for math, German, and school in general were assessed by means of three items on a five-point scale ranging form very much (1) to not at all (5) (see Table 5.1 for example items).

Results of the latent growth curve models indicated a significant decrease in students' intrinsic motivation for math and school in general over the four measurements in the investigation. Additionally, findings demonstrated significant interindividual differences in the decline; that is, the decrease in intrinsic motivation was found to be more pronounced for some children than for others. This is an important observation as it suggests that some children seem to be more at risk of losing their motivation to learn.

Despite the awareness for these individual differences, both researchers and educators still face stiff challenges in finding causes and explanations for this decline. The next section aims to deliver some potential explanations that are discussed as having an impact on students' intrinsic motivation.

Possible Explanations for the Decline in Intrinsic Motivation

Various reasons have been discussed when it comes to explaining the decrease in students' intrinsic motivation. These include, for example, a lack of fit between students' developmental needs and the school environment (Eccles & Midgley, 1990), as well as the absence of appropriate challenges and the relevance of the curriculum (Lepper & Henderlong, 2000). Some of the most prominent motivation theories (e.g., expectancy-value theories or self-determination theory) hold that positive ability beliefs are an important prerequisite for experiencing intrinsic motivation (Ryan & Deci, 2000; Wigfield & Eccles, 2000; see below). Furthermore, parents, teachers, and other practitioners often argue that the implementation of grades might be responsible for the typically observed downward trend (see below), as grades put an increased emphasis on performance as compared to mastery

goals (Lepper & Henderlong, 2000). The upcoming subsections will give an overview of the presumed mechanisms behind these assumptions and describe related studies.

Are Children's Ability Self-Concepts Responsible for the Decline in Their Intrinsic Motivation?

Ability self-concepts are usually defined as individuals' cognitive representations, that is, knowledge and perceptions, of their level of ability in various achievement situations (Bong & Skaalvik, 2003). Such ability self-concepts are also examined under the label of competence beliefs or self-perceived abilities (Herbert & Stipek, 2005; Wigfield et al., 1997).

The idea that students' self-evaluations of their ability might impact on their intrinsic motivation can be traced back to White's (1959) influential work on effectance motivation, postulating that individuals have an inherent desire to feel competent. According to White, feeling competent and enjoying task engagement are the same. Building on White's (1959) more general theorizing, Harter (1981) refined and extended White's assumptions in an effort to provide testable hypotheses under a developmental perspective on competence beliefs. Harter distinguished between competence beliefs as cognitive representations of the level of one's ability and motivational orientations, that is, intrinsic and extrinsic motivation. In Harter's (1981, p. 38) effectance motivation model, intrinsic pleasure in task engagement is a function of successful mastery of challenging tasks and perceived competence. Conversely, failure and perceived lack of competence should result in anxiety in mastery situations, an emotion known to be incompatible with enjoyable feelings. In postulating this sequential process, Harter disentangles perceived competence and motivational orientation and predicts that higher levels of perceived competence entail higher levels of intrinsic motivation. Some of the best elaborated modern motivation theories share the assumption that more positive ability self-perceptions should generate more intrinsic motivation for a given task (Deci & Ryan, 1985; Wigfield & Eccles, 2000).

Despite the high plausibility of the hypothesis that prior self-evaluations influence later intrinsic motivation, and the observation of equally declining competence beliefs made by teachers and developmental researchers, there is little empirical evidence to support this notion. At first sight, the positive correlation between students' competence beliefs and their intrinsic motivation (Wigfield & Eccles, 2000) seems to support the assumption

that people feel especially intrinsically motivated by those activities that they are good at. However, beyond these medium to strong concurrent associations, longitudinal studies have found either no or only weak evidence for potentially causal influences of competence beliefs on the development of intrinsic motivation (Jacobs et al., 2002; Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2005; Nurmi & Aunola, 2005; Skaalvik & Valas, 1999; Spinath & Spinath, 2005; Spinath & Steinmayr, 2008). Additionally, only a few studies also paid attention to recommended methodological guidelines (e.g., Marsh, 1990) when investigating longitudinal data.

One of the most extensive studies concerning the link between intrinsic task values and competence beliefs was conducted by Eccles and her associates, and relied on the sample of the *Michigan Childhood and Beyond Longitudinal Project* (Jacobs et al., 2002). The development of children's ability self-perceptions, task values, and activity choices was investigated from Grade 1 to Grade 12. Hierarchical linear modeling was used to analyze the development of task values and academic self-concepts. When the development in task values was controlled for competence beliefs, the linear trends of the developmental curves were reduced in all investigated domains. Even though these results document the relation between ability beliefs and task values over time, they cannot be interpreted causally. The change in task values was not controlled for prior task values nor could the direction of a potential influence be clarified.

In a Finnish study, Nurmi and Aunola (2005) assessed intrinsic task values and ability self-beliefs in 6- to 7-year-olds on two measurement occasions during Grade 1 and Grade 2. By means of cluster-by-states analysis for longitudinal data, these authors, as well, found no association between academic self-concept and mathematical or reading task values when controlling for prior task values. The fact that this study found no evidence for potentially causal influences between competence beliefs and intrinsic values might be due to the young age of the investigated children who had probably not yet acquired a concept of ability as a capacity of the individual (Nicholls, 1978).

Whereas the two studies cited above did not use structural equation modeling (SEM), the following studies used methodological approaches partly in line with the recommendations of Marsh and his colleagues (Marsh, 1990). Within SEM, two models are combined: a measurement model analyzing patterns of associations between observed variables and their underlying latent factor, and a regression model allowing analysis of relations among the underlying latent factors (Burkholder & Harlow, 2003).
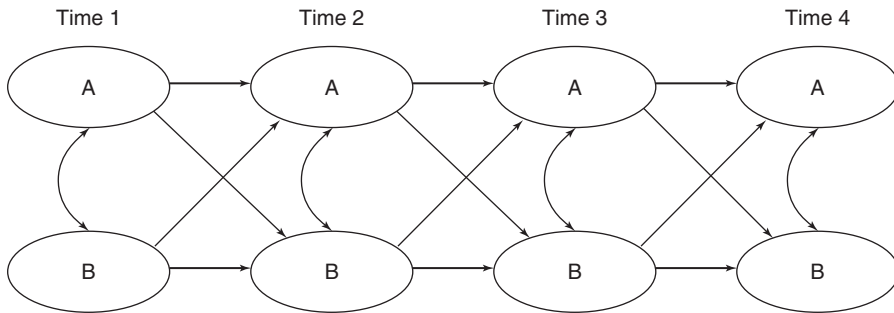
Figure 5.2. Fully Cross-Lagged Model for Two Variables A and B over Four Time Points.

One application of SEM to longitudinal data is the cross-lagged panel design. The cross-lags within these models connect the results of a variable A on measurement occasion 1 with a variable B on occasion 2, and vice versa (see also Figure 5.2). So it is possible to find out more about the direction of causality, as the size of the cross-lag coefficient provides information on the question of which variable in the model can be seen as cause or effect. Cross-lagged models have the advantage of making it possible to examine how prior measured variables contribute to the explanation of the total variance in addition to cross-sectional relations and stabilities of the concepts (Backhaus, Erichson, Plinke, & Weiber, 2003).

Skaalvik and Valas (1999) investigated mathematical and verbal ability self-concepts and motivation in three age groups (third, sixth, and eighth graders) over 2 school years with two measurement occasions. Motivation was measured by items reflecting either interest or the will to invest in a certain subject. Six models were tested (two for each domain in each grade), resulting in little evidence for directional effects between competence beliefs and motivation. With one exception, none of the cross-paths reached statistical significance (in math, the path from motivation at Time 1 to ability self-concept at Time 2 was significant). One feature of this study that might have impeded finding reciprocal effects is that the measurement occasions were rather far apart. The confirmation of directional effects might depend on the right time lag between measurement occasions. It has been argued that intervals between measurements should not be too long (Eccles, 2005) to prevent potential reciprocal influences from being masked by other processes. On the other hand, observations need to cover a sufficiently long time for effects to manifest themselves.

Another study that failed to find evidence for reciprocal effects between intrinsic motivation and competence beliefs is reported by Spinath and Spinath (2005). Five cohorts of elementary-school children ranging from Grade 1 to Grade 4 participated in the study. The cohorts were followed over a period of 2 years and children gave self-reports on their motivation (i.e., intrinsic values and learning goals) and their competence beliefs for school in general every 6 months. Data was analyzed by comparing a more complex reciprocal-effects SEM with a more parsimonious correlational model omitting the reciprocal effects (see also Figure 5.2). There was no evidence of directional influences over time because the correlational model described the data as well as the reciprocal model did. Again, there are reasons why the study by Spinath and Spinath (2005) might not have detected reciprocal effects (see Eccles, 2005). First, the different constructs were not measured as latent variables. Hence, models were not controlled for measurement errors and this might have masked true effects. Second, the interval between measurement occasions might again have been too long. Third, it might be argued that intrinsic motivation and competence beliefs need to be measured domain-specifically to find reciprocal influences.

Most of the cited studies were conducted with elementary-school students, as it is argued that experiences made early in life may shape later behavior, and the level of intrinsic motivation in the early years may have far-reaching consequences for initial and future school success (Gottfried, 1990). Nevertheless, one could also argue that the last years in school are an important developmental stage to investigate as students are then allowed to make their own decisions about their future, for example, whether to continue school, what major to choose, or what professional career to aspire to (Spinath & Steinmayr, 2012).

Spinath and Steinmayr (2008, 2012) conducted two studies investigating the impact of prior competence beliefs on students' intrinsic motivation: one with an elementary-school-students cohort and another with a cohort of eleventh-grade students. In their 2008 study, a sample of 670 German elementary-school pupils delivered self-reports on their intrinsic motivation and competence beliefs for math, German, and school in general four times within 1 year. To see if any causal relations between students' intrinsic motivation and their competence beliefs existed, two competing models were again set up: one cross-lagged model and one correlational model (without cross-lags). In most cases, mere correlational models provided as good descriptions of the data as more complex cross-lagged models. Following the rule of parsimony, in this case the less complex model is to be

preferred over the more complex one. Moreover, the cross-paths between intrinsic values and competence beliefs, overall, were very weak. Only three out of 24 cross-lags reached significance, and they were spread over all three domains as well as different measurements.

The second study conducted by the authors (Spinath & Steinmayr, 2012), examined the causal ordering of intrinsic motivation and competence beliefs for math, German, and school in general in a sample of $N = 348$ German eleventh-grade students who were followed for 1 year (two measurement occasions). Results of the SEMs yielded only weak support for the assumption that prior competence belief might impact on subsequent intrinsic motivation: competence beliefs did not predict subsequent intrinsic motivation in two out of three domains (school in general and math), but did so for German.

One possible explanation for the typical absence of effects of prior competence beliefs on subsequent intrinsic motivation is that any effect might be masked by moderator variables. For example, it could be argued that competence beliefs should be important for the experiencing of task enjoyment only under a performance goal orientation not a learning goal perspective. Under the latter, success depends on the perception that one has improved one's abilities (Dweck & Leggett, 1988). Improving one's competence and perceiving learning progress is possible at different ability levels and, therefore, at all levels of ability self-concepts. Thus, from a learning goal perspective, ability self-concepts should not influence intrinsic motivation.

By contrast, under a performance goal orientation, success depends on the demonstration of competence relative to others (Dweck & Leggett, 1988). The goals of demonstrating high competence or of not demonstrating low competence are more likely to be reached when ability self-concepts are positive. Therefore, students with strong performance goals should enjoy task engagement more when they have more positive ability self-concepts. In the case of negative ability self-concepts, students with performance goals should lose their task enjoyment because engaging in tasks for which one has low ability self-perceptions makes goal attainment unlikely. Following this line of argumentation, it might be expected that the association between competence beliefs and intrinsic motivation is moderated by goal orientations. In the presence of strong learning goals, competence beliefs should have no influence on the change in intrinsic motivation. In the presence of strong performance goals, however, prior competence beliefs should affect subsequent intrinsic motivation in such a way that lower competence beliefs

predict a decline in intrinsic motivation. However, the results provided no support for the assumption that goal orientations moderated the association between competence beliefs and intrinsic motivation. However, the study did provide strong evidence for a direct influence of learning goals on intrinsic motivation (Spinath & Steinmayr, 2008).

The only study using SEM that found evidence for reciprocal relations between an indicator of intrinsic motivation and competence beliefs was reported by Marsh and colleagues (2005). Two large samples of seventh graders gave self-reports on their mathematical ability self-concept and interest twice in 1 school year. These authors found significant reciprocal standardized path weights (ranging from .04 to .10) between ability self-concept and interest. Although this methodologically sophisticated study produced evidence in favor of a reciprocal relationship over time, the effects were fairly small and ran in both directions; that is, prior competence beliefs had effects on subsequent interest and vice versa.

Taken together, if the magnitudes of these cross-paths are taken as estimates for potentially causal effects, these results indicate that competence beliefs have, if any, only a small influence on the change in intrinsic motivation. Specifically, when using cross-lagged analyses, the cross-paths from prior competence beliefs to subsequent intrinsic motivation while controlling for prior intrinsic motivation have been, if significant at all, very small in size (Marsh et al., 2005; Skaalvik & Valas, 1999; Spinath & Spinath, 2005; Spinath & Steinmayr, 2008).

Are Children's Grades Responsible for the Decline in Their Intrinsic Motivation?

Parents, teachers, and other practitioners alike often argue that grades are one of the main culprits of the negative development of students' motivation. Self-determination theory (Ryan & Deci, 2000) appears to be a useful frame by which to consider the potential impact of grades on students' intrinsic motivation. In this theory, the authors argue that intrinsic motivation grows out of two primary needs: the need for competence and the need for autonomy. Especially with regard to students' autonomy, one could argue that grades, although often advocated as an impetus for striving and seen as an external reward for academic efforts, may, particularly when they are administered in a controlling way (Deci & Ryan, 1985), lead to a negative development of students' intrinsic motivation. According to Deci and Ryan (1985), it appears probable that, in cultures where much pressure

is focused around grades, there might be a general tendency for grades to be interpreted as controlling.

Several studies have documented significant positive associations between students' intrinsic motivation and their grades (Corpus, McClintic-Gilbert, & Hayenga, 2009; Lepper, Corpus, & Iyengar, 2005); the direction of this relationship, however, still appears to be unclear to date (Corpus, McClintic-Gilbert, & Hayenga, 2009). Marsh et al. (2005), for example, conducted a longitudinal study using data from two nationally representative samples of German seventh-grade students. The results indicated that, although effects were generally small, effects of T1 interest on subsequent grades were stronger than the effects of T1 grades on subsequent T2 interest (this path was not significant).

Besides these interesting findings, which highlight the significant role of intrinsic motivation in the academic context, the remaining question to be answered is whether the often observed decrease in intrinsic motivation is a general developmental trend and holds for all students or to what extent differential developments are observed depending on what grades students obtain. To find an answer to this question, Steinmayr, Freiberger, and Spinath (submitted) conducted a study with a sample of $N = 542$ German second-grade elementary-school pupils. On seven measurement occasions at 4-month intervals, children delivered self-reports on their math-related intrinsic motivation. Teachers reported students' math and language grades. Growth-curve models were used to examine the developmental changes in students' intrinsic motivation. The results revealed a significant decline for intrinsic motivation, but further analysis showed that neither math grades nor language grades were significantly related to the decline in students' intrinsic motivation. Accordingly, the results indicate that grades cannot be seen as the culprit for the decline in students' intrinsic motivation.

Summary

After highlighting the relevance of intrinsic motivation in the academic context, the present chapter has provided an overview of its development with a special focus on the elementary-school years. Two main constructs were assumed to be responsible for the typical decline in students' intrinsic motivation: their ability self-concepts and their grades. In both cases, the reported findings appear counterintuitive and contradict the widespread notion that negative competence beliefs and poor grades are detrimental

for positive affects for learning. These findings show that students' intrinsic motivation for school-based learning does not necessarily suffer in the face of low competence beliefs and poor grades. It is important for teachers to know this, in case they feel as if they are doing harm when grading their students.

With regard to the findings concerning students' competence beliefs, the results allow some speculation about more and less effective methods for fostering high, sustained intrinsic motivation, as well. Many teachers believe that declining intrinsic motivation to learn is an inevitable consequence of children's increasingly realistic self-perceptions. Some teachers might therefore try and preserve children's unrealistic ability self-perception by giving either unrealistically positive or vague feedback (Spinath & Steinmayr, 2008). On the basis of the documented findings, such practices will probably fail to preserve children's intrinsic motivation. The development of realistic ability self-perceptions is an important developmental task, which needs to be supported by realistic feedback. If the decline of intrinsic motivation in school-related learning is not linked to declining competence beliefs, then it should be possible to disentangle the developmental curves of the two constructs.

All in all, the results give rise to optimism: even in the face of realistically held low ability self-concepts and poor grades, learners can develop an optimistic, learning-oriented perspective in which they consider low competencies as learning opportunities and learning as an end in itself.

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Part 2

Parenting and Children's Development

6

Parents' Role in Infants' Language Development and Emergent Literacy

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One of the most compelling questions on early development concerns how infants transition from prelinguistic babblers to relatively savvy consumers and users of words and sentences in a span of only a few years. We share with a long history of scholars the view that the remarkable feat of learning language is the outcome of a reciprocal, collaborative process. Infants construct meaning out of shared activities with members of their cultural communities, most notably parents (Tamis-LeMonda & Song, 2012). For their part, parents facilitate language learning by responding to infants' gaze, touch, gestures, and vocalizations with words for relevant objects, actions, or events (Bloom, 1993); they tailor the lexical diversity and grammatical complexity of their language to meet the developing skills of their infants; and they provide infants with multimodal sensory, redundant information (e.g., gesturing toward an object while labeling) that visibly marks the referents of conversations. These social interactions lead to a shared system of words and meanings (Nelson, 2007), a perspective that can be traced to Vygotsky's (1978) "Zone of Proximal Development" (ZPD) and Bruner's (1983) conceptualization of the "Language Acquisition Support System" (LASS) and parental "scaffolding" (Wood, Bruner, & Ross, 1976).

Parents are also primary agents in children's emergent literacy. In cultural communities across the globe, parents socialize their young children to enter the larger world of literacy even before children can speak. In the United States specifically, parents engage their children in an array of literacy activities that includes book reading, storytelling, sharing personal narratives, reciting nursery rhymes, learning the alphabet, numbers, and letters, and visiting venues such as libraries or museums. As children participate in these everyday literacy activities, they develop a set of specialized skills for interpreting and expressing meanings through printed words and graphics (most notably depicted in books) and for participating in extended oral discourse (Rodriguez et al., 2009; Rodriguez & Tamis-LeMonda, 2011).

In this chapter, we highlight parents' role in infants' early language development and emergent literacy, with emphasis on the putative mechanisms that underlie parent–child associations. We focus on infancy and early childhood, a period when children are rapidly learning new words (lexical development), the rules for combining words (grammatical development), social norms for participating in conversations with others (pragmatic development), and conventions around print and storytelling (literacy development). These developmental tasks are the building blocks for children's successful integration into their larger cultural communities.

Lexical Development

Vocabulary lies at the heart of language development. Words represent the concepts and categories that comprise an interconnected system of cultural knowledge, and are the primary vehicle for effectively communicating with others. The importance of early vocabulary growth for children's cognitive development, emotional and social skills, and school readiness is undisputed. Vocabulary size relates to infants' cognitive skills even in tasks that do not involve language, such as object sorting (Gopnik & Meltzoff, 1987) and object recognition (Smith, 2003). Moreover, individual differences in early vocabulary size predict language skills, reading achievement, and cognitive development years later, and these long-term associations are mediated through various mechanisms, including growth in knowledge, grammatical development, phonological awareness, and listening comprehension (Bates & Goodman, 1999; Dionne, Dale, Boivin, & Plomin, 2003; Marchman & Fernald, 2008; Marchman, Martínez-Sussmann, & Dale, 2004; Metsala, 1999; Sénéchal, Basque, & Leclaire, 2006).

Parents' Role in Lexical Development

What roles do parents play in early lexical development? Clearly, children will only learn the words and phrases to which they are exposed, and in this regard most of the words they hear early in development are those uttered by their parents. In particular, parental speech characterized by *diversity* (i.e., the use of different word types and different communicative functions) is associated with children's vocabulary size, rate of vocabulary growth, and communicative diversity (e.g., Hart & Risley, 1995; Hoff, 2003; Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991; Tamis-LeMonda, Baumwell, & Cristofaro, 2012), phonological awareness (Metsala, 1999; Sénéchal et al., 2006), listening comprehension (Sénéchal et al., 2006), and cognitive skills and school performance (Huttenlocher et al., 1991; Marchman & Fernald, 2008). Moreover, there is lexical specificity in parent–child speech associations: Children are more likely to use words that are frequent in their parents' speech (de Villiers, 1985; Naigles & Hoff-Ginsberg, 1998). Although most researchers study mothers' speech to children, fathers' speech also predicts children's language development. In one study, fathers who expressed a greater variety of words (word types) to their 2-year-olds had children with better expressive language skills at 36 months (Pancsofar & Vernon-Feagans, 2006). Moreover, fathers' contributions to children's language development held after controlling for parental level of education, quality of child care, and the same aspects of maternal language. In another study, fathers' vocabulary during book sharing predicted more advanced language development in children at 15 and 36 months beyond family demographics, child characteristics, and mother education and vocabulary (Pancsofar & Vernon-Feagans, 2010). In our work, fathers' didactic language is associated with their 2-year-olds' cognitive scores on the Bayley MDI (mental development index; Shannon, Tamis-LeMonda, London, & Cabrera, 2002) and predicts toddlers' language skill at and between 2 and 3 years after controlling for the same measures in mothers (Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004), while fathers' diversity of language (word types and language functions) is associated with infants' language diversity at 2 years of age (Tamis-LeMonda, Baumwell, & Cristofaro, 2012).

Beyond providing infants with the words of their language, parents facilitate the matching of words to their referents through nonverbal behaviors such as gesturing. Parents use gestures to elicit infant attention and mark referents for infants, who learn new actions by observing adults' actions (Hay, Murray, Cecire, & Nash, 1985; Rowe & Goldin-Meadow, 2009a,

2009b). The coupling of gestures with verbalizations more effectively elicits infant attention than maternal verbalizations alone (Peláez-Nogueras, Field, Hossain, & Pickens, 1996; Stack & Muir, 1992), possibly because gestures make parents' intentions salient and "narrow the search space" (De Villier Rader & Zukow-Goldring, 2010, p. 206). Moreover, the synchronization of gestures and words creates a unitary experience for infants who perceive the synchronized stimuli as "belonging together" (de Villiers Rader & Zukow-Goldring, 2010).

Empirical research supports the benefits of gestures for infant word learning (Acredolo & Goodwyn, 1988; Matatyaho & Gogate, 2008; Rowe & Goldin-Meadow, 2009b; Rowe, Özçalişkan, & Goldin-Meadow, 2008; Zukow-Goldring & Arbib, 2007). Parent gestures relate to infant gestures (Rowe et al., 2008; Rowe & Goldin-Meadow, 2009b), which in turn predict lexical development and sentence complexity (Rowe & Goldin-Meadow, 2009b), the developmental timing of two-word speech (Iverson, Capirci, Volterra, & Goldin-Meadow, 2008), and infants' understanding and imitation of verbal directives around action (Tamis-Lemonda, Song, Leavell Smith, Kahana Kalman, & Yoshikawa, 2012). In one experimental study, infants who observed a dynamic "show" gesture that was synchronized with object labeling were more likely to look to the object/referent when the word was spoken and to learn the word–object pairing than infants who did not experience dynamic synchronization between words and gestures (de Villiers Rader & Zukow-Goldring, 2010).

Word–referent matching is also enhanced through the *timing* of parents' verbal input. In particular, parents' *responsiveness*, defined as prompt, contingent, and appropriate verbal replies to infants' exploratory and verbal initiatives (Bornstein, Tamis-LeMonda, Hahn, & Haynes, 2008; Tamis-LeMonda & Bornstein, 2002; Tamis-LeMonda & Baumwell, 2011) consistently predicts children's gains in language (Landry, Smith, & Swank, 2006). Parents who are verbally responsive, for example, by providing labels for objects and events that are under joint attention, serve as tutors who constrain interpretive possibilities, thereby increasing the likelihood that children will correctly infer the meaning of verbal information and learn new words (Baumwell, Tamis-LeMonda, & Bornstein, 1997; Bloom, 1993; Moore & Dunham, 1995; Tamis-LeMonda, Bornstein, & Baumwell, 2001; Tamis-LeMonda, Bornstein, Baumwell, & Damast, 1996; Tomasello & Carpenter, 2007). Moreover, children are inclined toward environmental contingencies early in development (Dunham & Dunham, 1995). Contingent responses

to infants' behaviors are salient to infants, and this saliency might form the basis for more expedient learning (Tamis-LeMonda & Bornstein, 2002).

Finally, parental responsiveness is part of a transactional process (Sameroff, 1975). By definition, parental responsiveness reflects the temporal sequence "child-act-and-parent-respond" (Bornstein et al., 2008), a sequence that depends on children's contributions to the interaction. A mother can only responsively imitate and expand on infant vocalizations if her infant vocalizes; she can only respond to play initiatives if her infant engages with objects or toys in the environment. Thus, studies of parental sensitivity are, by definition, studies of a reciprocal process between child and parent that unfolds in real time as well as over the course of children's development.

Grammatical Development

Children's grammar or syntactic skills refer to the application of language-specific rules to the combination of words into sentences. During the one-word period of language development, infants use isolated words to express the core elements of a grammar. For example, "daddy" might be used as sentence subject (actor), object (patient), adjective (possessor), etc., depending on context. Over time, infants combine words to express semantic relations among the elements. For example, the phrase "daddy pasta" might indicate that father is eating pasta (an actor–object of action relation), being fed pasta (a patient–object relation), or that it is father's bowl of pasta (possessor–object possessed relation). During the third and fourth years of life, children display a burst in their grammatical development, as they add prepositions, conjunctions, tenses, and other morphological elements to their constructions (Bates & Goodman, 1997).

Grammatical development facilitates the learning of new words at unprecedented rates (Anisfeld, Rosenberg, Hoberman, & Gasparini, 1998), and early grammatical skills (e.g., the mean length of children's utterances) predict preschool lexical development (Dionne et al., 2003; Moyle, Weismer, Evans, & Lindstrom, 2007). Reciprocally, lexical development promotes further grammatical development, with bidirectional associations documented in both typical and delayed population (see Bates & Goodman, 1997 for review).

The mechanism thought to underlie the associations between grammatical and lexical development is that of syntactic bootstrapping (Gleitman & Gleitman, 1992). According to this idea, the syntactic frame of a sentence

constrains the logical interpretations that a child can make about the meanings of novel words (Naigles & Swensen, 2007). For example, the grammatical structure of the sentence "the dork is glorping the bing" suggests that "dork" and "bing" are nouns, that "glorp" is a verb, and that the "dork" is doing something to the "bing". Experimental studies indicate that young infants are quite savvy at inferring meaning from syntactic structures. Eighteen-month-olds look longer at pictures of objects than at pictures of actions when hearing "this is a gep" (vs. "it geps"), and vice versa (Echols & Marti, 2004). When novel verbs were used in transitive frames (e.g., "the duck is *gorping* the bunny"), 2-year-olds connected the verbs with pictures that displayed causative actions (e.g., duck pushing rabbit); in contrast, when verbs were used in intransitive frames (e.g., "the duck and the bunny are *gorping*"), infants connected them with non-causative actions (e.g., duck and rabbit flexing their arms; Naigles, 1990). In general, infants between the ages of 17 months and 2 years can use syntax to determine parts of speech, contrast proper nouns with common nouns, count nouns with mass nouns, and specify the meaning of verbs (e.g., Arunachalam & Waxman, 2010; Brown, 1957; Gleitman & Gleitman, 1992; Hall, Lee, & Bélanger, 2001; Katz, Baker, & Macnamara, 1974; Naigles, 1990, 1996; Taylor & Gelman, 1988; Waxman & Kosowski, 1990).

Parents' Role in Grammatical Development

Although many linguists often highlight universal features of grammar and "innate" processes of learning grammatical rules in line with the work of Chomsky (1965), there is evidence that environmental factors contribute to individual differences in children's grammatical skill (Dionne et al., 2003). Similar to findings on children's lexical development, the diversity of parental language predicts children's grammatical skills. In one study, the diversity of parental speech (i.e., lexical, constituent, and clausal input) predicted 14- to 46-month-old children's constituent and clausal diversity (Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010).

   Parents also tailor the grammatical complexity of their language, typically measured as the mean length of utterances, to match that of their children's language (Bornstein, Haynes, & Painter, 1998; Huttenlocher, 1998; Snow, 1972; Tamis-LeMonda, Baumwell et al., 2012). Moreover, there is evidence of specificity in these relations. Associations have been documented between the proportion of multiclause sentences in parent and children's speech, the number of noun phrases in parent and child speech (Huttenlocher,

Vasilyeva, Cymerman, & Levine, 2002), and the frequency and variety of verb frames in maternal speech and children's use of verbs (Naigles & Hoff-Ginsberg, 1998). And, studies comparing the grammatical skills of children from low- versus middle-income households suggest that grammatical features of parents' language explain socioeconomic status (SES) differences in children's language. Specifically, children from middle SES display higher scores on clausal diversity and the proportion of multiclause sentences in their speech compared to low SES children, with differences being partially mediated by the more complex syntactic constructions of their mothers (Huttenlocher et al., 2002; Huttenlocher et al., 2010).

Although most studies on this topic are correlational, intervention research supports causal inferences. In one intervention study, 4-year-old children listened to passive sentences (vs. active sentences) and subsequently demonstrated improved performance in their production and comprehension of passives (Vasilyeva, Huttenlocher, & Waterfall, 2006).

Pragmatic Development

Learning the words of one's language and the grammatical rules for combining those words into sentences is only a part of the challenge for young children. Children must also learn the pragmatics of language: the implicit rules for using language in socially acceptable ways in cultural activities. Thus, studies of pragmatics emphasize conversational and social-conventional skills including idiomatic expressions and inferences, turn-taking, repair of conversational breakdowns, politeness, and effective adaptations to interlocutors and specific contexts.

Infants display rudimentary pragmatic skills even before they learn to talk, as seen in their use of sounds (babbling), affect (smiles), and actions (waving arms) during turn-taking exchanges with their parents (Stern, 1995). Between 1 and 3 years of age, children exhibit rapid advances in an array of pragmatic skills, including using protoimperatives (e.g., waving hands) to express requests or rejections, using protodeclaratives (e.g., showing) to initiate joint attention (Bates, 1976), combining gestures and words to elicit and direct others' attention (e.g., saying "ball!" and pointing to a ball; Snow, Pan, Imbens-Bailey, & Herman, 1996), responding appropriately to conversational breakdowns (e.g., by modifying speech when others do not understand; Comeau, Genesee, & Mendelson, 2010; Tomasello, Farrar, & Dines, 1984), and making requests ("*want*") and offers

("*let*"; Reeder, 1980). Over the next few years, children develop their abilities to modify speech for different conversational partners (e.g., using more repetition when talking to infants), using expressions of politeness, asking questions, giving reasons, being persuasive, and telling stories (Clark, 2009). Pragmatic skills are critical for effective communication, social and behavioral adjustment, and later school achievement. Consistent associations have been documented between pragmatic skills and 1- to 5-year-old children's social status with peers (Nærland, 2011), preschool children's behavioral adjustment and social competence rated by parents and teachers (McCabe, 2005), and teacher expectations of preschoolers' attractiveness, social skills, and future achievements (Becker, Place, Tenzer, & Frueh, 1991). Pragmatic skills also reflect and reinforce social-cognitive skills. Turn-taking and rules around politeness and effective conversations require children to recognize social norms, inhibit inappropriate responses, and consider the listener's perspective. Perhaps unsurprisingly, autistic children with deficits in theory of mind have difficulties in narrative production and comprehension, which prevent them from engaging in effective communications (Barnes & Baron-Cohen, 2011). Similarly, typical preschoolers with higher level of theory of mind are able to tell more coherent and social cognitively sophisticated stories (Curenton, 2004).

Parents' Role in Pragmatic Development

Parents use both explicit and indirect strategies to teach children norms about when to talk and what to talk about. In terms of *when* to talk, parents tutor children on norms for joining conversations, through explicit statements (e.g., "You can talk in just a minute"; Ely, Gleason, MacGibbon, & Zaretsky, 2001) and/or implicit signals (pausing, orienting toward or gesturing to the child to indicate his/her turn). These rules of participation vary enormously across cultural communities. For example, middle-class U.S. parents tend to encourage children to actively participate in conversation, compared to Chinese mothers who tend to dominate the conversation (Wang, Leichtman, & Davies, 2000). Similar cultural differences have been documented in the dinner table conversations and storybook sharing of parents and children from U.S., Norwegian, and Latino cultures (Aukrust, 2004; Melzi & Caspe, 2005). These differences might reflect different values of social hierarchy in communities. Middle-class American parents tend to treat their children as equal conversational partners and expect children to take turns spontaneously, whereas parents from other cultures take a dominant role in

a conversation and thus engage children in a question–answer interaction (e.g., Aukrust, 2004; Melzi & Caspe, 2005; Wang et al., 2000).

In terms of *what to talk about*, parents channel their children toward acceptable and expected conversations through questions (e.g., "Did you tell dad what we did today?") and directives (e.g., "Say *thank you*"; Ely et al., 2001). Parents also correct children's inappropriate expressions and pragmatic errors (e.g., "*What* did you say?") and reinforce and model appropriate expressions (e.g., *praising* a child after he/she says "goodbye"; Becker, 1988, 1994; Burdelski, 2010; Geer, 2004; Gleason, Perlmann, & Greif, 1984; Kobayashi, 2001). Again, pragmatics around the content of parent–child conversations differ across different cultural communities. For example, when sharing books with children, Chinese immigrant mothers talked more about behaviors than European American mothers, who more frequently commented about thoughts and emotions (Doan & Wang, 2010). During dinner table interactions with preschoolers, Norwegian parents were more likely to talk about language *per se* (e.g., word use, pronunciation, "Guys is a slang word for men") than their American counterparts. Also, Norwegian children engaged in talking about conversations (e.g., past conversations; "Did you talk about activity day?") more often than their American counterparts, who were more likely to participate in talking about discourse management (e.g., turn taking, "Let me tell you something!"; Aukrust, 2004). In a study of ethnically diverse families in New York City, Latino mothers (Mexican and Dominican) were more likely to use language to regulate 1- to 2-year olds' actions ("Put it there") compared to African American mothers who were more likely to use language to teach their infants about the world ("That's a blue block"; Tamis-LeMonda, Song et al., 2012).

Literacy Development

Children growing up in schooled societies are "expected to develop habits and values that attest to their membership in a 'literate society,' and early enculturation with written materials are emblematic of such expectations" (Heath, 1982, p. 51; Tamis-LeMonda & Song, 2012). In early childhood, before the formal literacy skills of reading and writing are acquired, focus is on the developmental precursors to literacy, referred to as "emergent literacy." The emergent literacy skills include growth of language, concepts and knowledge, articulation, phonological awareness, print concepts and

awareness, and early forms of writing such as scribbles and drawings (Ferreiro & Teberosky, 1982; Homer & Nelson, 2005; Whitehurst & Lonigan, 1998).

Engagement in literacy activities such as book reading promotes children's emergent literacy skills. For example, book-reading experiences with parents expand children's lexicons and support children's achievement of labeling (Ninio & Bruner, 1978). Infants and toddlers who participate in frequent book-reading activities are more advanced in their language and cognitive skills compared to their peers who are rarely read to by their parents, and regularity of book reading in infancy has long-term implications for school success (Bus, van Ijzendoorn, & Pellegrini, 1995; Duursma et al., 2007; Patterson, 2002; Payne, Whitehurst, & Angell, 1994; Raikes et al., 2006; Rodriguez & Tamis-LeMonda, 2011; Scarborough & Dobrich, 1994; Sénéchal & LeFevre, 2002; Whitehurst et al., 1994).

In turn, these emergent literacy skills relate to later measures of cognitive development, positive attitudes toward literacy, school readiness, and later reading achievement (Bus et al., 1995; Dickinson & Tabors, 1991; Raikes et al., 2006; Sénéchal, LeFevre, Hudson, & Lawson, 1996; Whitehurst & Lonigan, 1998). For example, one study shows that reading in the first and second grade is strongly determined by individual differences in children's emergent literacy skills such as linguistic awareness, letter knowledge, and emergent writing measured in kindergarten (Whitehurst & Lonigan, 1998).

Parents' Role in Literacy Development

Children's emergent literacy skills develop through everyday interactions with parents, especially those around books and literacy materials. During "reading cycles," mothers socialize their infants on ways to participate in "initiation-reply-evaluation sequences", by asking questions, awaiting replies, and then providing feedback. For their part, infants quickly learn the "rules of literacy" (Heath, 1982), including rules around "turn-taking." Over time, children become skilled at recognizing their role as listener, wait for adult cues regarding appropriate times to speak, and acknowledge and answer the questions posed to them. By age 3 years, infants use their knowledge of what books do to suspend reality and depart from the truth with pretend or fantasy stories (Heath, 1982).

The skills children develop during these reading cycles mirror structural features of classroom lessons, and therefore arm children with interactive strategies for classroom participation (Sinclair & Coulthard, 1975). Teachers ask questions of children while holding prespecified answers in mind,

and children who are able to effectively engage in question-reply-evaluate dialogues are better poised for school success.

Perhaps unsurprisingly, the language parents direct to children during book reading is richer and more diverse than in other situations, which may explain the benefits of book-reading interactions for early language development. In one study of mothers interacting with their 18- to 29-month-olds, mothers used more words, a greater diversity of words (word types), and grammatically more complex language during book reading than during mealtime, dressing, and toy play (Hoff-Ginsberg, 1991). The heightened use of certain forms of language during book reading is also seen in mothers from diverse ethnic backgrounds in the United States. In one study, we videotaped mothers from Mexican, Dominican, and African American backgrounds sharing wordless books and sharing beads and a string with their infants of 14 months and 2 years of age. During book sharing, mothers of the three ethnicities used more "referential language" (i.e., statements that provided information about objects, events, and activities, using specific nouns, adjectives, and adverbs; e.g., "These are two cookies") during book sharing than bead stringing. In contrast, during bead stringing mothers used more "regulatory language" (i.e., statements that directed children's attention and actions; e.g., "Look here" "Put it there"), which contained high proportions of pronouns rather than nouns and descriptors (Tamis-LeMonda, Song et al., 2012).

Because the benefits of bookreading are well established, book reading is often included in parent-training programs. However, other literacy acitvities such as joint writing also promote children's emergent literacy (Reese, Sparks, & Leyva, 2010). For example, an intervention study showed that mother–child joint writing-facilitated children's growth in alphabetical skills, beyond the effect of joint storybook sharing and drawing/painting activities (Levin & Aram, 2012).

Conclusions

Children's interactions with parents are foundational to their development of vocabulary, grammar, pragmatics, and emergent literacy; in turn, these early-developing skills forecast children's achievements in language development, reading, math, and social and emotional domains. A main goal of this chapter, therefore, was to highlight specific behaviors in parents that positively influence children's language development and emergent literacy.

As reviewed, there is convincing empirical evidence for the importance of four specific features of parents' language for children's early language development: language that is diverse in word types and communicative functions; language that is contingently responsive to infants' exploratory and communicative overtures; language that is coupled with behavioral cues that saliently mark referents; and language that is grammatically complex and attuned to children's growing language skills. Beyond these specific features of language, parents indirectly and directly socialize their children to the communicative norms of their cultural communities. These norms include expectations and practices around when to talk and what to talk about, as well as expectations and practices around literacy. When parents engage children in routine activities such as book sharing, storytelling, rhyming, drawing, and writing, they are indoctrinating them into the larger literate society.

A second goal was to address developmental mechanisms. That is, *why* might these various parenting behaviors and emerging child skills matter? At the most basic level, children typically learn the words and phrases they hear, which highlights the importance of *frequency of exposure*. Accordingly, children who are more often exposed to language that is diverse and complex have more frequent opportunities to learn those words and constructions than children who hear less diverse and/or complex speech. Similarly, children who frequently experience routines around book reading become more knowledgeable about the social norms around literacy practices than children who less frequently experience such routines. This includes knowledge that stories unfold chronologically as pages are turned; that words and letters map to pictures and stories; and that people sharing books take on different roles, such as reader and audience or interviewer and interviewee.

A second explanation highlights the importance of *easing the word-referent mapping task* for children. Parents' provision of multimodal, redundant information (e.g., gestures with language) and contingent verbal responses to children's behaviors functions to narrow the search space for children who are attempting to figure out the meaning of unfamiliar words. Thus, a mother who points while simultaneously labeling an object is providing her child with cues as to which object is being spoken about. Similarly, a father who promptly labels an object that his child looks at and touches is offering verbal information that is temporally synchronized with his child's visual and tactile exploration. The benefits of these behaviors also generalize to shared literacy exchanges. Parents often point to pictures they talk about, and contingently respond to children's gaze and vocalizations with questions and story-related information to signal the story's meaning.

A third explanation highlights the importance of *tailoring the complexity of the input*. During early periods of language development, children benefit from syntactic frames that are simple and attuned to their skill level. However, as children become capable of deciphering the meanings of embedded, multiclausal sentence structures, and of using those structures independently, parents' use of well formulated, complex grammatical structures provides children with models of proper usage. Parents also tailor the complexity of their language during literacy exchanges with children. They use simple sentence frames when sharing books with young infants, but more elaborate sentences, punctuated with frequent questions, when sharing books with toddlers and preschoolers. As such, parents "up the ante" of their language and interactions in ways that align with their children's developing skills.

A final explanation speaks to the importance of *socializing culturally valued skills*, which is reflected in parents' teaching children the pragmatics of a language, but also much more. As parents talk with children, respond to children's bids, read to children, share memories of the past, and so forth, they are conveying important cultural messages that extend well beyond the content of their words. With a nod of the head, or a subtle frown, by asking or not asking a question, and by channeling topics of conversation, parents socialize their children about the ways to behave in social situations, when to talk, what to talk about, and why. Indeed, parents seek to promote skills in children that will grant their children admission to a larger world of opportunities. For this reason, it is only apt that a book on *child wellbeing* includes a chapter on parents' influences on children's language and literacy development. These skills are undoubtedly the earliest, and perhaps most significant, benchmarks for children's successful integration into society.

Acknowledgment

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Can Parents Be Supported to Use a Responsive Interaction Style with Young Children?

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Responsive Parenting from Two Theoretical Frameworks

Responsive parenting has been described as an affective-emotional style of interaction between caregivers and their children that includes acceptance of a child as a unique individual with needs and interests of their own (Darling & Steinberg, 1993). In attachment theory, a caregiver's responses are contingently linked to the child's signals in a prompt and sensitive way. These contingent responses, if used consistently, provide the child with feedback that their needs are important and that they are valued and loved. The child, in turn, develops trust and a secure bond with their caregiver and their environment through a process of internalization (Ainsworth, Blehar, Waters, & Wall, 1978; Bornstein & Tamis-LeMonda, 1989). This process has been described as a three-term chain of events in which the young child signals, and the caregiver responds in a prompt and sensitive manner that is contingent to what the child is signaling. The child, in turn, experiences that their needs are met in a predictable and sensitive manner (Bornstein & Tamis-LeMonda, 1989). Through this process, the young child learns to self-regulate, as responsive interactions facilitate the development of mechanisms for coping with stress and novelty. With repeated and successful early responsive interactions with their caregivers,

infants and young children develop important cognitive associations as they assimilate their learning from one experience and apply it to learning gained in another (Bornstein & Tamis-LeMonda, 1989; Grusec & Goodnow, 1994). Studies emphasizing responsiveness in terms of how the contingency of the response provides affective-emotional support often show relations with children's emotional and social outcomes.

Emotionally responsive behaviors can include expressions of warmth and positive affect and avoidance of negative behaviors such as a harsh voice tone or punitive restrictiveness. These behaviors together with contingent responsiveness are often described as being important for children's social skills (cooperation, taking social initiative) and regulation of affect because they help children learn to make appropriate choices (Grusec & Goodnow, 1994; Parpal & Maccoby, 1985).

Responsiveness has also been defined as a broader construct associated with the sociocultural theory (Vygotsky, 1978) that includes distinct but related behaviors that have shown support for a range of both social and cognitive outcomes (Landry, Smith, & Swank, 2006; Tamis-LeMonda, Bornstein, & Baumwell, 2001). Thus, in addition to affective-emotional behaviors, research on responsiveness from a social-cultural framework has demonstrated a responsive component that encompasses cognitively supportive behaviors (Landry, Smith, Swank, Assel, & Vellet, 2001). Responsive behaviors that fit into the sociocultural framework encourage joint engagement and reciprocity in dyadic interactions (Bakeman & Adamson, 1984). Maintaining children's foci of attention by building on their focus of interest (Akhatar, Dunham, & Dunham, 1991; Tomasello & Farrar, 1986), in contrast to redirecting their attention, supports children's immature attention and cognitive capacity, as it does not require children to inhibit a response to something of interest and reorganize a new response (Tomasello & Farrar, 1986). The use of rich verbal input that is responsive to children's signals (Landry et al., 2006; Tamis-LeMonda et al., 2001), another behavior from the sociocultural framework, supports children's language development. Caregivers' contingent vocal responsivity and their imitation of infant vocalizations are important direct environmental influences on children's development that are not confounded by shared genetic variance (Hardy-Brown & Plomin, 1985).

There is empirical support for behaviors across these different theoretical frameworks (i.e., attachment, sociocultural) forming distinct factors that correspond to the different aspects of responsiveness, identified in conceptual frameworks in the literature, that are stable across time and contexts.

Significant correlations among the factors demonstrate that, although there are unique aspects of responsiveness, they share common variance and, therefore, could be considered as part of a broader responsiveness construct (Landry et al., 2006).

Much of the research on the importance of responsive parenting for promoting children's development is based on descriptive studies. This research is valuable for providing empirical support for inferring the importance of responsive parenting for children's development but does not allow a causal influence to be inferred, as experimental studies are necessary to determine causality. A small number of experimental intervention studies do provide some evidence for responsive parenting playing a causal role in supporting children's social-emotional development (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003; Van Zeijl et al., 2006). Another group of experimental studies showed support for a causal influence of responsive parenting for children who were at high risk for poorer outcomes (e.g., prematurity, adopted) with responsiveness promoting better cognitive and social outcomes (Beckwith & Rodning, 1992; Juffer, Hoksbergen, Riksen-Walraven, & Kohnstamm, 1997; Patterson & Barnard, 1990). Other interventions that have attempted to facilitate responsive parenting with high-risk children have found some support for interventions being able to change certain responsive behaviors and bring about at least short-term increases in young children's skills. This was found for children maltreated and/or in foster care (Linares, Montalto, Li, & Oza, 2006; Toth, Maughan, Manly, Spanola, & Cicchetti, 2002), parented by depressed mothers (Toth, Rogosch, Manly, & Cicchetti, 2006), and from poverty homes (Royce, Darlington, & Murray, 1983).

A Responsive Parenting Intervention during the Infancy Period

In response to the need to better understand unanswered questions about the role of responsive parenting, a random assignment intervention, Play and Learning Strategies (PALS) (Landry et al., 2006; Landry, Smith, Swank, & Guttentag, 2008; Landry et al., 2012) was designed and implemented to answer the following questions:

1. Do increases in responsiveness behaviors as defined from a broader construct (affective-emotional and cognitively responsive) promote increases in infants' social-emotional and cognitive skills?

2. Does the support from increased parent responsiveness promote similar increases in social and cognitive skills for infants of varying degrees of risk for poorer developmental outcomes?
3. Can infants whose mothers received PALS generalize their use of better social skills in interactions with a novel adult, in addition to using them in interactions with their mothers?
4. Do aspects of responsiveness across the two different theoretical frameworks (attachment and sociocultural) mediate the effect of PALS on different infant outcomes (social versus cognitive)?

As these questions had not been considered within a single investigation prior to PALS, the intervention was designed to address them.

The 264 mothers, all of lower socioeconomic status (SES), recruited for the intervention, were randomly assigned to receive PALS ($n = 133$) versus a developmental assessment screening (DAS) attention control condition ($n = 131$). Mother–infant pairs in both PALS and DAS participated in 10 weekly home-visit sessions when their infant was 6–10 months of age with 9% attrition across pre, interim, post, and follow-up assessments. In order to examine the question related to the effectiveness of PALS for infants of varying risk status, premature very low-birth-weight infants of low and high medical risk were included ($n = 144$) as well as healthy infants born at term ($n = 120$). Randomization was done using a stratified approach to ensure comparable numbers of infants born term and preterm were in the PALS versus DAS conditions. Details for the characteristics of the mother–infant dyads are in Landry et al. (2006).

PALS incorporated factors known to impact intervention efficacy: short-term period of intervention, starting later in the first year of life, a clearly defined focus, and linking intervention goals to theoretical frameworks (Bakersmans-Kranenburg et al., 2003). Eight of the ten sessions targeted different responsive behaviors across the two theoretical frameworks: (a) responding contingently to infant signals, (b) expression of warmth and positive affect with avoidance of negative responses, (c) maintaining and building on infants' interests, and (d) using rich language input that is responsive to signals (e.g., labels of objects and actions, and support for understanding conceptual links between objects and actions). Sessions also emphasized how mothers could use these responsive behaviors in an integrated way in everyday activities with their infant (e.g., feeding, bathing, dressing, playing). For two of the eight sessions, the mother was asked to invite someone to the session who was close to her and the

infant (e.g., infant's father, grandparent, friend) and then she explained and demonstrated to this person the PALS responsive behaviors that she had learned up to that point. This provided a check of her knowledge and also brought someone else into the learning process who would support her in her efforts to use the responsive behaviors and might also get interested in using the behaviors themselves.

The PALS home visits were guided by a detailed curriculum that included behaviors linked to four aspects of responsiveness supported by the literature, and the format included facilitators (a) asking mothers to review their experiences across the last week related to their efforts to try the targeted behaviors, (b) describing the current visit's targeted behavior, (c) watching and discussing with mothers the educational videotape of mothers from similar backgrounds, (d) videotaping mothers interacting with their infants in situations that the mothers selected (e.g., toy play, feeding, bathing) with coaching, (e) supporting mothers to critique their behaviors and the infants' responses during the videotaped practice, and (f) planning with mothers how to integrate responsive behaviors into their everyday activities with laminated cards defining the behavior and its importance provided to support practice.

In order to determine the effectiveness of PALS, assessments of mother–child interactions during toy play and daily activities were conducted using videotaped observation procedures that occurred 2 weeks prior to the first PALS session, after the fifth session, 2 weeks after the completion of the last session, and about 3 months later. The videos were coded for mothers' use of the targeted responsiveness behaviors (e.g., contingent responsiveness, avoidance of restrictiveness and harsh voice tone, warmth, rich verbal input). The targeted responsiveness behaviors formed four main components based on conceptual and empirically based groupings: contingent responsiveness, warm sensitivity, maintaining and encouraging infant interests, and rich verbal input. Aspects of infants' early communication, social skills, and positive and negative affect also were coded for their responsiveness to mothers' requests and for their use in initiating interactions. These infant skills also were observed and coded while infants interacted with an examiner in a toy-centered scripted interaction where the examiner used voice tone, verbal encouragement, facial expression, and pacing to engage the infant in the interaction. This interaction was included in order to determine if the infants whose mothers received PALS would show greater increases in social skills compared to those whose mothers received DAS, even when interacting with an unfamiliar person. Standardized assessments of cognitive and language skills

as well as a videotaped observation of the infant engaged in an independent toy-play activity were also included.

The PALS intervention facilitated mothers showing greater increases in behaviors associated with all four aspects of responsiveness. Increases in these behaviors, in turn, resulted in greater increases in the infants' skills. Infants whose mothers received PALS as compared to those whose mothers received DAS showed greater improvements in social cooperation and aspects of emotional development (decreased negative affect), as well as in cognitive skills (increased use of words and more complex play skills). These increases also were seen when the infants interacted with a novel adult, suggesting that these improved abilities had internalized from ongoing responsive interactions with their mothers. This finding suggests that the infants had developed internal resources that allowed them to function in novel and more stressful situations as they were able to regulate their behavior without the direct responsive support of their mothers. Other evidence of internalization was seen in the infants' ability to show more complex play with objects when playing independently. The greater increases in independent play skills support theories suggesting that increasing competence in the presence of supportive others provides a foundation for learning in independent problem-solving situations (Bruner, 1972; Wertsch, 1979). Increased infant competence was thought to occur because of the PALS mothers' steady increases in their responses to their infants that were sensitive, prompt, and contingent to what the infant signaled, as well as their inclusion of rich language input. In contrast, mothers who received the attention control condition, DAS, decreased over time in their use of behaviors that were contingently responsive, increased in intrusive and restrictive behaviors, and showed lower and flat levels of rich language input. Theoretical descriptions of responsive parenting hypothesize that the form of nurturing support demonstrated by mothers receiving PALS at relatively high levels and provided consistently results in young children showing a greater willingness to cooperate, as this parenting style promotes a sense of give and take and sharing of control (Grusec & Goodnow, 1994).

The Need for Consistency in Responsive Parenting across Early Childhood

The focus of the PALS I intervention was facilitation of caregivers' use of responsive behaviors with their infants across the first year of life. The

findings demonstrated that caregivers could increase their use of a range of behaviors that, in turn, explained increases in infants' social-emotional and cognitive skills. What was not determined with this study was whether infancy was a particularly important developmental period for this form of parenting. Some theories give a special importance to the infancy period for responsive parenting (Ainsworth et al., 1978), although they also describe the importance of this form of parenting continuing into other developmental periods. However, findings from correlational studies demonstrate the need for consistency in responsive parenting across early childhood development for more optimal social and cognitive development (Landry et al., 2001). The findings from Landry et al. (2001) showed that when responsive parenting was at higher levels only across the infancy period, children's cognitive and social development at entry into kindergarten was comparable to that of children whose parents had low responsiveness across infancy and only moderate responsiveness in the toddler/preschool period. The only group of children in the sample of families from lower SES backgrounds that showed age-appropriate social and cognitive development at entry into kindergarten was made up of those whose caregivers used responsiveness at relatively high levels across the entire early childhood period. This was true for those born healthy and at term as well as for those born preterm and with very low birth weights.

Thus, a second phase of PALS was developed to address the question of whether support for caregivers to use responsive behaviors across their infants' first year of life versus during the toddler/preschool period was adequate to see sustained increases in cognitive and social-emotional skills, or was PALS during the infancy and toddler/early preschool period required for sustained increases in development. Although the importance of being consistently responsive across the entire early childhood period has been described in theoretical frameworks and in correlational studies, it had never been systematically examined experimentally. The cohort of families in the PALS infancy study was a particularly appropriate group to address this question, as they had lower levels of education, fewer economic resources, and many were parenting children at high biological risk because of their premature birth. One challenge parents face in meeting the demand of consistent responsive parenting across early childhood is a lack of understanding of their children's changing developmental needs across this age period, and how to respond sensitively to them. Parents with fewer economic resources or lower levels of education are at higher risk of having difficulty in attending to this complex and demanding process. For example, poverty is associated

with lower levels of parental sensitivity and increased use of power-assertive control techniques (McLoyd & Wilson, 1990) and less rich verbal stimulation (Hart & Risley, 1995). By the toddler period, when children seek more independence but still require high levels of responsive support, high control techniques and parent attitudes that include believing children should always be compliant can result in high levels of parent negativity and rejection of young children's needs. Descriptive support for parents from low SES backgrounds having trouble with showing high levels of responsive parenting across early childhood comes from a correlational study where only 25% of a large cohort of low SES families showed relatively high levels of responsiveness across infancy and toddler/preschool period (Landry et al., 2001). When mothers from low SES backgrounds are parenting a child born very premature and of very low birth weight (VLBW), consistency in responsive parenting can be particularly challenging (Landry, Smith, Swank, & Miller-Loncar, 2000). Problems associated with VLBW and a preterm birth include infants' inability to clearly signal caregivers about their needs (Brachfeld, Goldberg, & Sloman, 1980), more difficulty learning from interactions without specialized support (Garner, Landry, & Richardson, 1991), and problems with organizing their behavior (Landry, Leslie, Fletcher, & Francis, 1985). The greater risk for poorer parenting for parents of low SES and/or those parenting an infant born VLBW suggest that this is an important group of caregivers to include when investigating the question of the optimal timing for an intervention to impact responsive behaviors.

A Responsive Parenting Intervention during the Toddler/Preschool Period

A second intervention, PALS II, was developed to address the question of whether mothers who received PALS I across the infancy period would require a second dose during the toddler/preschool period in order to continue to show high levels of responsiveness. PALS II was an adaptation of the PALS I curriculum targeting the same group of responsive behaviors with video examples of mothers using the behaviors with toddlers and young preschoolers. One additional session was developed that targeted how to responsively support young children's challenges with regulating their behavior (see Landry et al., 2008 for details). Mothers who received PALS I were randomly assigned to either receive PALS II or the attention control condition, DAS II, during the toddler/preschool period (PALS I/

PALS II, $n = 34$; PALS I / DAS II, $n = 33$). Mothers who received DAS I were also randomized into these two conditions (DAS I / PALS II, $n = 50$; DAS I / DAS II, $n = 49$). This design allowed for the examination of whether mothers required a second phase of PALS to continue to use higher levels of responsive behaviors or whether PALS during the infant or toddler period was adequate for showing high levels of responsive parenting behaviors.

The expectation was that mothers who received PALS I and PALS II would show higher levels of responsive behaviors compared to mothers in all other groups. This was hypothesized, as building on skills mothers had established from PALS I was expected to facilitate their ability to better understand and respond positively to their child's changing developmental needs. Also, mothers who received either PALS I or PALS II were expected to show greater increases in responsive behaviors compared to mothers who received DAS I and DAS II.

Similar to PALS I, mothers were videotaped participating during daily activities and toy play with their children as part of their pre, interim, post, and follow-up assessments in order to determine if responsive behaviors and child social and language skills increased across the intervention. This second intervention phase started when children were between the ages of 24 and 28 months of age with 75% of the original sample who were eligible for recruitment due to child's age ($n = 222$) agreeing to participate ($n = 166$). Approximately 90% of the mothers in this second phase completed all of the home visits and the assessments. In addition to the videotaped coded observations, children received standardized language assessments (i.e., Preschool Language Scale, 3rd Edition; Zimmerman, Steiner, & Pond, 1992; Peabody Picture Vocabulary Test, 3rd Edition; Dunn & Dunn, 1997).

The results of this second phase showed that determination of the optimal timing of PALS (only early, only later, early and later) for facilitating mothers' use of responsive behaviors depended on factors such as the type of support the behavior provided and the biological risk status of the child (preterm versus term birth).

Responsive behaviors that provided children with nurturance and warmth were best facilitated with PALS I, whether or not mothers received PALS II. Warm sensitivity, positive affect, and attentiveness to children's attentional focus were at the highest levels and/or showed the greatest increases with PALS I. It is noteworthy that warmth and positive affect are described in the attachment framework as particularly important across the first year of life for establishing a secure and trusting relationship between a mother and

her infant (Ainsworth et al., 1978). The results of the PALS intervention provide causal support for the critical importance of these behaviors during the first year of life. Of special interest is that the unique salience of the first year of life for these behaviors at higher levels was found for mothers of children born term and those born preterm.

Several responsive behaviors associated with the sociocultural theory were best facilitated for mothers receiving PALS II, whether or not they received PALS I. For example, verbal scaffolding, which provides children with verbal information about what objects and actions are called and how they are linked conceptually, was best facilitated during the toddler/preschool period, but this was particularly true for mothers of children born term. Participation in PALS II also best enhanced verbal encouragement and this was true for mothers of children born term and preterm.

One maternal behavior that only showed greater increases for mothers of both groups of infants if the intervention occurred during infancy and the toddler/preschool period was contingent responsiveness. One explanation for this finding is that this behavior, although also associated with attachment theory, is more complex than warm sensitivity and positive affect, as it requires a caregiver to appreciate the child as a unique individual with needs and interests of their own. With this level of understanding, the caregiver is more likely to notice what the child signals their needs are and then respond promptly, sensitively, and contingently to that need. With facilitation from both PALS I and PALS II, mothers seemed to be able to adapt to the child's changing needs and provide the appropriate responsive support, even though that support often needed to look different across these developmental periods.

As mothers receiving the PALS intervention increased in their responsiveness, one would expect to see increases in the children's social and cognitive skills. The findings supported this expectation, as significantly greater increases and/or higher levels were seen in social and language abilities for children whose mothers received PALS during one or both developmental periods. Social skills were best supported for term- and preterm-born children if their mothers had PALS at least during the toddler/preschool period (i.e., cooperation) or during both periods (i.e., social engagement). Better language development occurred for children whose mothers had PALS at least during the later period and this included use of words during social interactions, vocabulary on standardized measures, and, for children born term, composite language skills. The complex skill of coordinating joint attention with verbalizations required mothers to have

PALS across both developmental periods for children born term to show faster increases compared to children in the other groups.

These findings, along with support from mediation analyses, are encouraging as they provide some of the first evidence for the causal role of responsive parenting in enhancing children's development. They also provide information on the developmental periods across early childhood when specific aspects of responsiveness are more likely to be positively impacted with an intervention. Behaviors associated with attachment and sociocultural frameworks explained the effect of the intervention on greater improvements in children's skills.

The findings described above demonstrate that mothers can be facilitated to increase their use of responsive behaviors in everyday activities and during toy-centered play interactions with their children. Both of these social contexts were targeted in the intervention as times when mothers were supported by their coaches to practice their use of responsive behaviors.

The findings also provided evidence for children's ability to internalize and then generalize their learning to new experiences based on their repeated experiences in previous responsive interactions. This was illustrated with the findings showing greater increases in social skills with the unfamiliar examiner and in complex independent play skills for the children whose mothers received PALS as compared to those with DAS.

Generalization of Responsive Behaviors to Shared Book-Reading Activities

One area of early development that has not been examined in relation to responsive parenting is young children's early literacy skills. Shared book reading is an important activity between parents and young children for children to develop early literacy skills such as vocabulary and knowledge about books (Bus, van IJzendoorn, & Pellegrene, 1995; National Early Literacy Panel, 2008), skills that are related to later reading achievement (Lesemen & de Jong, 1998). Thus, there was an interest in examining whether the PALS intervention would result in mothers being able to generalize their use of responsive behaviors to a shared book-reading activity with their child.

Although there are a number of studies reporting findings from highly targeted shared-reading interventions, the questions addressed with the PALS intervention were different, as effective shared-reading practices were

not targeted in PALS. Findings from parent book-reading interventions, in general, show moderate effects on children's expressive vocabulary and small effects on receptive language, but particularly for children at low risk for literacy problems (Mol, Bus, de Jong, & Smeets, 2008). Thus, a third study addressed whether a broader responsive parenting intervention, such as PALS, that promotes repeated responsive parent–child interactions across daily activities, would support caregivers to generalize these practices to book-reading activities with children at high risk for later literacy problems. Families from low SES, such as the families that received PALS, are reported to be less likely to read to their children, as only 39% of children whose mothers have a high school diploma are read to every day compared to 74% of children whose mothers have a college degree (Federal Interagency Forum on Child and Family Statistics, 2009). These statistics suggest that the children who could benefit most from interactions with caregivers that expose them to new words and ideas found in books are those least likely to have these experiences (Payne, Whitehurst, & Angell, 1994).

To examine changes in mothers' shared book-reading behaviors, video-taped observations of mother–child interactions while sharing a book were made for all mothers and their children across the four groups (PALS I/PALS II; DAS I/PALS II; PALS I/DAS II; DAS I/DAS II). These interactions were videotaped prior to the beginning of the PALS II intervention, after session five, 2 weeks after the completion, and approximately 3 months later. To enhance young children's early literacy skills through shared book-reading experiences, responsive behaviors from an affective-emotional domain as well as a cognitive-linguistic domain are described in the literature as beneficial (Britto, Brooks-Gunn, & Griffin, 2006; Fletcher & Reese, 2005; Leseman & de Jong, 1998). For example, from an affective-emotional domain, positive interactions with minimal restrictions (Bus & van IJzendoorn, 1997), the use of praise to encourage children's involvement (Britto et al., 2006), and a positive affective quality to the experience (Sonnenschein & Munsterman, 2002) predict more child engagement and/or cooperation during the shared reading activity. From a linguistic domain, language supports including book-related conversations (Fletcher & Reese, 2005) and caregivers' provision of verbal scaffolding to encourage children to label and ask questions are also important responsive behaviors during book-reading activities.

Guided by the research on supportive behaviors for promoting young children's early literacy skills through shared book-reading activities, maternal affective/emotionally and linguistically responsive behaviors were coded

from the videotapes. For example, mothers' praise and encouragement and a rating of their contingent responsiveness were coded as affective-emotional support. Language facilitation techniques (e.g., expansions of the child's utterances), questioning techniques, and prompting for child language related to the book were included as cognitive/linguistic supports. Child behavior was coded for a broad range of language inputs and engagement in the shared reading activity.

The findings clearly demonstrated that mothers who received a broad responsiveness parenting intervention that did not directly target the use of responsive behaviors during shared reading activities could generalize these behaviors and use them effectively in this new activity. Most of the maternal shared book-reading behaviors significantly improved with the PALS intervention and timing of the intervention (i.e., infancy, toddler/preschool, or both) was also important in understanding these changes. This was true for mothers of children born term as well as for those born VLBW, and when there was a difference, the mothers of children born VLBW showed more positive changes in response to the intervention. The need to have both PALS I and PALS II in order to see these gains in positive shared reading practices was striking and included the majority of language-based maternal behaviors. A number of the verbal support and evocative behaviors required that mothers receive the intervention during infancy as well as the toddler/preschool period including open-ended prompts, language facilitation techniques, and general verbal supports that encourage or demonstrate problem-solving skills. The finding that the specific verbal techniques used to engage children in shared book reading required PALS at both the early and later developmental periods is interesting for what type of support it suggests a mother needs in order to be facilitated to effectively implement these techniques in situations not directly targeted in the intervention. All of these maternal supports during shared reading were directly linked to the child's verbalization. Thus, they required a mother to notice her child signaling and respond to the child promptly and sensitively in a way that was directly linked (i.e., contingent) to the signal. We previously found contingent responsiveness required the intervention across both age periods and thought this was because, to use this behavior consistently and at high levels, a caregiver needs to be able to appreciate the child as an individual with interests that may be different from his or her own. Thus, in the shared book-reading setting, the need for mothers' participation in both PALS intervention to use the verbal strategies during shared reading that were closely linked to children's behavior may be due to the

greater understanding and appreciation mothers gain about their children's behavior, including a willingness to support their interests. Most of the child behaviors that showed gains required their mothers' participation in PALS II or both PALS I and PALS II. For example, two child behaviors, (i.e., comments, engagement in the activity) showed significant gains only when children's mothers participated in both PALS I and PALS II. Higher level comments included describing a story element or picture, or making connections involving thematic elements of the story or between a story element and something that occurred outside the book. This finding suggests that, for facilitating complex language skills such as higher level comments, more intensity in intervention support for caregivers is required. These findings demonstrate that the effects of a broad responsive parenting intervention generalize to different activities and to the use of behaviors not directly facilitated in the intervention. All of the observed maternal behaviors were supported by PALS to show significantly stronger gains than for mothers participating in the attention control condition (DAS) across both developmental periods, but many of the verbal scaffolding behaviors required both PALS I and PALS II to show greater gains. An important outcome of this study is that the children participating in PALS showed greater gains in their verbal responses and verbal initiative related to the book and enhanced shared interest in the book with their mothers. PALS II or PALS I with PALS II provided the best support for children to show increases in their book-related verbalizations and increased engagement.

Responsiveness Behaviors Explain Increases in Children's Development

In addition to finding that PALS resulted in significantly greater increases in mothers' responsiveness and young children's social and cognitive-linguistic development compared to mothers and children without the intervention, mediation analyses demonstrated that specific responsiveness behaviors explained the increases in particular child skills. For example, children's increased cooperation was explained by responsiveness behaviors that cut across the two theoretical frameworks and provided different types of support. Responsiveness that was contingent on the child's signals, verbal encouragement that provided feedback about the child's behavior, and avoidance of restricting the child's behavior together were important in

understanding increased levels of child cooperation (Landry et al., 2006). Increases in young children's words were explained by mothers maintaining their children's interests and increases in the frequency with which they named objects and actions (e.g., boat, car, eyes, run, drink) during interactions with their child. Both of these responsive behaviors provide scaffolding for children's developmental needs in their efforts to learn to talk. Contingent responsiveness mediated the effect of PALS for children's increased social-emotional as well as their language development (Landry et al., 2008). Maternal attention to children's interests, verbalizations, and gestures in a sensitive, prompt manner explained higher levels of language development. This finding demonstrates that early language development is enhanced by caregiver behaviors that go beyond specific language input to also include the way in which the input is provided. Expressions of warmth and pleasure, behaviors from the attachment framework, also explained greater gains in language as well as social-emotional skills. It is noteworthy that these responsive behaviors were more important for understanding children's increased language skills than mothers' verbal input.

Mothers' behaviors during shared book reading explained the effect of PALS on increases in children's early literacy skills, including their ability to become more engaged and use more complex book-related language. A number of different types of child linguistic behaviors were directly influenced by increases in mothers' responsive behaviors. Maternal language facilitation techniques such as expanding on or assisting the child's talk about the book were important for understanding increases in child verbal versus behavioral responses. Children's comments and use of questions and requests benefited from maternal behaviors like praise and the use of general verbal supports (e.g., verbal prompting). Together, these findings from meditational analyses demonstrate support for the causal influence of a range of responsive behaviors from different theoretical frameworks for understanding more optimal cognitive and social development.

Conclusion

Responsive parenting has received attention for decades as a critically important style of interacting with children to support their development. There is strong empirical support for the positive relation of this important set of caregiver behaviors with aspects of children's social, emotional, and cognitive-linguistic development from correlational studies. However,

findings from experimental studies are necessary to demonstrate a causal influence of responsive parenting for more optimal child outcomes. This chapter describes a body of experimental intervention work that provides causal support for the role of responsive parenting in understanding young children's development. Behaviors from two theoretical frameworks (i.e., attachment, sociocultural) explain greater increases in both social-emotional and cognitive-linguistic skills across the first 4 years of life. This is consistent with theoretical frameworks defining responsiveness as a broad, rather than narrow construct. Also, the evidence shows that some responsive behaviors are best facilitated across the infant developmental period (i.e., warmth, expressions of pleasure), while others receive the best support during the toddler/preschool period (e.g., responsive verbal input). In contrast, contingent responsiveness and other verbal scaffolding behaviors that are directly linked to a child's signals require PALS across both developmental periods. It is noteworthy that the PALS responsiveness intervention was equally effective for mothers and their children whether the children were born at term or preterm. Additionally, children with both types of birth histories, whose mothers had PALS, were able to generalize their enhanced social and emotional skills to interactions with a novel adult and to show more complex cognitive skills during independent exploratory play. These findings support the hypothesis that responsive parenting not only supports children's development when they are interacting with their caregivers but also helps with their ability to develop the resources necessary to cope in novel situations as they internalize experiences with responsive support and learn to regulate their own behavior.

Finally, the mothers who received PALS across both developmental periods were able to generalize their use of increased responsive behaviors to a shared reading activity, a situation not directly trained as part of the intervention. Thus, the effects of a broad responsive parenting intervention can generalize to different situations where caregivers and young children interact that are not directly facilitated in the intervention.

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8

Parenting and Executive Function

Positive and Negative Influences

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For 5 days in August 2011, several cities in the United Kingdom were in flames, with rioters looting high street shops and destroying buildings in their local communities. Distressing video footage of the violence and chaos quickly went viral on the Internet, and considerable energy has since been devoted to gathering evidence on who was involved in these unprecedented scenes of unrest and why. In their most recent report, the Riots Communities and Victims Panel (2012) concluded that the riots were fueled by a range of factors, including a lack of opportunities for young people and failures of the justice system to rehabilitate offenders, coupled with materialism, widespread problems of self-control, and poor parenting. Having met people convicted of all kinds of riot-related offenses, as well as people from disadvantaged backgrounds who chose not to get involved in the riots, the panel concluded that the ability to make the right decision in the heat of the moment hinged on character: self-discipline, application, the ability to defer gratification, and resilience in recovering from setbacks. As the panel noted, it is parents who are best placed to instill positive attitudes and behavior in children. Thus fostering

children's character and self-control should be key goals for parents. This chapter provides a summary of research on a closely related topic, namely the nature and importance of parental influences on children's executive functions.

The term "executive function" (EF) has a dual definition, reflecting its roots in both cognitive and clinical psychology. From a cognitive perspective, it encompasses the set of higher order processes (such as inhibition of prepotent responses, shifting of attention, and working memory) that underpin goal-directed action and adaptive responses to novel, complex, or ambiguous situations (Hughes, Graham, & Grayson, 2005). From a clinical perspective, EF is used as shorthand for the functions of the prefrontal cortex (PFC), an area of the brain that differs from other brain regions in several respects, including its protracted maturation, which extends well into adolescence. As a result of this extended development, EF (like language ability, but unlike many other neurocognitive functions) is particularly susceptible to environmental influence and robustly associated with factors such as socioeconomic status (Noble, Norman, & Farah, 2005). Nevertheless, as outlined in the first preliminary section of this chapter, demonstrating causal environmental influences on EF (such as parenting) is remarkably challenging.

One source of direct evidence for environmental influences on children's EF is the positive impact of various interventions—these range from training on computerized tasks to school enrichment programs to physical activities such as yoga and aerobic exercise (for a recent review, see Diamond & Lee, 2011). Although none of these interventions involved parenting (the main focus of this chapter), they demonstrate that giving children sufficient opportunities and motivation to exercise their higher order thinking skills can lead to significant improvements in EF. This suggests that by encouraging goal-directed activities parents might be able to enhance their children's developing EF skills; this proposal is addressed in the second section of this chapter. To date, however, the most compelling evidence for parental influences on children's EF comes from demonstrations that neglect and abuse are associated with compromised brain development (for reviews, see Barrett & Fleming, 2011; Belsky & De Haan, 2011). The third section of this chapter considers whether more normative parental risk factors (e.g., maternal depression, family chaos) also compromise children's EF development. In the fourth and final section we offer some conclusions and outline new directions for research in this field.

Challenges for Researchers Investigating Parental Influences on Children's Development

Environmental influences are notoriously difficult to measure. As noted by Belsky and de Haan (2011), while more than 50 years of empirical research into parenting effects have revealed a plethora of associations between child outcomes and parental attitudes / practices, there is still little convincing evidence that parenting "in the normal range" affects children's development. One reason for this is that common genetic influences can, at least in part, explain associations between measures of parenting and child outcomes. Experimental manipulations are therefore needed to demonstrate causal influences, but these are obviously limited by ethical constraints.

Fortunately, studies that adopt genetically sensitive designs (e.g., Kovas, Haworth, Dale, & Plomin, 2007) suggest two general conclusions that help to shed light on whether genetic factors are likely to underpin apparent "environmental" effects. First, genetic factors are of primary importance in explaining stable individual differences, but environmental factors are important for understanding change. Second, while genetic factors are typically general in their impact, environmental influences have much greater specificity. Taken together, these findings suggest that parenting research should adopt cross-lagged longitudinal designs and include several outcome measures in order to assess both whether a particular aspect of parenting predicts *change* over time in a given outcome measure and whether it has specific predictive effects. Moreover, researchers should assess multiple aspects of parenting (e.g., warmth, harshness, sensitivity, responsiveness, monitoring), because these may have distinct effects on children's development (Belsky & De Haan, 2011).

Also worth noting is that parental influences show a nonlinear threshold effect: Variation in parenting quality typically has an especially strong impact at the bottom end of the scale. Indeed, above a threshold (often dubbed "good enough" parenting), the effects of variation in parenting quality appear extremely modest (Scarr, 2000). Researchers therefore need to include samples that are sufficiently large and diverse to avoid type II errors (false negatives). Underlining this issue of power, researchers have shown that, even at the risky end of the spectrum, there is marked variation in children's susceptibility to parenting. As a result, the concept of resilience has become a hot topic for research (Luthar, Cicchetti, & Becker, 2000). Interestingly, some children show heightened susceptibility to both positive and

negative experiences (Belsky, Bakermans-Kranenburg, & Van IJzendoorn, 2007). This heightened susceptibility is associated with phenotypic factors (e.g., temperament), endophenotypic factors (e.g., physiological reactivity), and genetic factors (Belsky et al., 2009; Belsky & Pluess, 2009).

Beyond both the intrinsic difficulty of disentangling genetic and environmental effects and the issues of power noted above, conclusions from studies of parenting are also often limited by their heavy reliance on structured questionnaires. Although quick to administer and reasonably reliable, questionnaires not only lack sensitivity (there is often a wide gap between what parents say and what parents do), but also fail to capture interactive and dynamic aspects of parenting. Direct observations provide a valuable means of addressing these problems; indeed, replacing questionnaires with direct observations appears to double the magnitude of parental influence (Zaslow et al., 2006). However, observational research is very time-consuming and so restricts the size of sample that can be studied. This problem is compounded by the fact that different research groups often adopt different coding schemes, making it hard to pool data or draw comparisons across studies. As a result, observational findings can appear patchy and difficult to generalize across samples. This may explain why early observational studies of parent–child interactions are often overlooked in current research on social influences on EF. To rectify this gap, findings from observational studies of how parents can scaffold young children's EF are outlined in the next section of this chapter.

Can Parents Scaffold Their Children's EF Skills?

Studies of social influences on EF have, to date, focused heavily on the preschool years, and are typically framed within sociocultural accounts of how interactions with more competent social partners foster children's higher order cognitive functions (e.g., Vygotsky, 1962, 1978). Within this framework, a key premise is that all real learning is situated within the child's "zone of proximal development," a cognitive space in which children who cannot yet function independently are able to function when supported by more expert adults (Mattanah, Pratt, Cowan, & Cowan, 2005). This support is described metaphorically as parental "scaffolding": instructional interaction that is aimed at extending the child's knowledge, reducing task complexity, and transferring responsibility while providing emotional support.

Below we review two separate strands of observational studies of preschoolers that consider how parents can help their children (a) engage in effective planning and problem solving and (b) refrain from responding impulsively in tempting situations. Next, we outline findings from the handful of studies that have examined parental contributions to EF in middle childhood.

Parental Scaffolding of Preschoolers' Planning Ability

Early studies (e.g., Wood, Bruner, & Ross, 1976) showed that the success of scaffolding is jointly determined by parental support and children's current cognitive abilities. Although framed within sociocultural theory, this demonstration of child-driven effects raises the possibility that the effects of scaffolding are actually genetically mediated, suggesting that studies need to adopt a cross-lagged longitudinal design to assess gains in EF while controlling for associations with other cognitive domains (to ensure that effects are specific rather than general). Adopting this approach with a socially diverse sample of 125 families, Hughes and Ensor (2009a) found that individual differences in maternal scaffolding while completing jigsaws with their 2-year-olds, indexed by an aggregate scale that reflected frequencies of elaborative talk (i.e., cognitive support), praise and encouragement (i.e., emotional support), and open-ended questions (i.e., transfer of responsibility), predicted individual differences in gains between the ages of 2 and 4 in children's EF, assessed using a comprehensive battery of experimental tasks. This predictive relationship remained significant even when age 4 verbal ability, family background, and other parenting measures (e.g., mean length of utterance in an unstructured mealtime observation and self-reported inconsistent parenting and family chaos) were all taken into account. Thus, this longitudinal study provides quite robust evidence that by "scaffolding" their children's goal-directed activities, mothers are able to foster the emergence of EF in the early preschool years.

Another longitudinal study, by Neitzel and Stright (2003), although smaller in scale, provides both greater ecological validity and a finer grain of analysis: (a) by adopting kindergarten observations (rather than experimental tests of EF) to assess five separate areas of self-regulation: metacognitive talk, task persistence, behavior self-control, effective self-monitoring, and appropriate requests for assistance; and (b) by examining individual differences in each of these measures in relation to variation in the three distinct aspects of maternal scaffolding (cognitive support, emotional support, and transfer

of responsibility). Two findings from this study deserve particular mention. First, scores for scaffolding fully mediated the relationship between maternal education and ratings of children's self-regulation (or EF) in kindergarten. This is important because EF is known to predict success in the transition to elementary school (Hughes & Ensor, 2011; Hughes, Ensor, Wilson, & Graham, 2010), as well as in the transition from elementary to middle school (Jacobson, Williford, & Pianta, 2011). Thus, interventions that support maternal scaffolding may help promote school readiness among children with less educated parents. Support for this proposal comes from a study of 126 Head Start preschoolers, observed completing puzzle tasks both alone and with their mothers (Robinson, Burns, & Davis, 2009). Interestingly, performance on the solo task was only related to children's attention-regulation skills (a close proxy for EF) in the context of high maternal scaffolding. According to Robinson et al. (2009), this interaction shows that low-income mothers who recognize their children's abilities and provide an appropriate amount of support can enhance their children's developmental competence.

The second interesting finding to emerge from Neitzel and Stright's (2003) study was that, replicating findings from an earlier study of older children (Stright, Neitzel, Sears, & Hoke-Sinex, 2001), maternal cognitive support was only beneficial if it was provided in small steps. Interestingly, another observational study of parental scaffolding, conducted by Bibok, Carpendale, and Müller (2009), has also shown that the timing of maternal interventions is critical. Together, these three studies suggest that effective parental scaffolding requires high levels of working memory and monitoring (see also Barrett & Fleming, 2011). Studies of adults (e.g., Grant, Thase, & Sweeney, 2001; Kaneda, 2009; Moritz et al., 2002; Nakano et al., 2008; Sweeney, Kmiec, & Kupfer, 2000) demonstrate that depression and anxiety both reduce EF. This is important because, as described in the next section of this chapter, low maternal wellbeing may also contribute to poor EF in young children. These observational studies add to this literature by suggesting mechanisms that may mediate this association between maternal wellbeing and child performance. For example, effective scaffolding requires parents to plan and oversee the execution of a shared task and then, as the child gains in confidence, shift their role to one of support and encouragement (Wertsch, 1985). This process is known in the literature as the "contingent shift principle" and is measured by a change in the specificity of parental contributions: Effective scaffolding is indexed by both increased specificity in response to child failure and reduced specificity in

response to child success. Importantly, this latter shift is only possible once children are able and motivated to take the lead, which, in turn, depends on achieving a joint focus of attention. As a result, parents can best support their children's learning when they "connect" with what children are saying, thinking, or doing (cf., Ensor & Hughes, 2008). Indirect support for this view comes from two separate studies that highlight the importance of attachment security as a predictor of children's EF skills (Bernier, Carlson, Deschênes, & Matte-Gagné, 2012; Jacobsen, Huss, Fendrich, Kruesi, & Ziegenhain, 1997).

Other studies have focused on mediators of the relationship between maternal scaffolding and child EF. For example, using a relatively large "risk" sample (253 children who varied in neonatal complications and in their degree of risk for later developmental problems), Landry, Smith, and Swank (2003) applied structural modeling to show that mothers' verbal scaffolding at age 3 (but not at age 4) predicted children's EF at age 6 (measured by search retrieval and independent goal-directed play), and that this predictive link was mediated by language and nonverbal problem-solving skills at age 4. More recently, Matte-Gagné and Bernier (2011) have also reported that child language skills mediate the relationship between maternal scaffolding and child EF. In this study, 53 families were visited at home three times, when the study children were aged 15 months, 2 years, and 3 years. Their results indicate that the mediating effect of child language is specific to impulse control (rather than working memory or set shifting). This pattern of specific effects leads us nicely to the second strand of research, which has focused on parental socialization strategies for promoting children's self-control.

Teaching Preschoolers Self-Control

Crucially, the construct of EF includes not just the execution of goal-directed acts, but also the inhibition of maladaptive prepotent responses (e.g., resisting the temptation to touch a desirable but prohibited toy or snack). In a classic study, Mischel, Shoda, and Rodriguez (1989) tested this ability to "delay gratification" by asking 4-year-olds to wait 15 minutes before eating an attractive marshmallow snack and found that those who could wait were, as adolescents, cognitively and socially competent, achieving higher academic results than their peers and coping better with frustration and stress. In a recent long-term follow-up of 60 individuals from this original sample, Casey et al. (2011) showed that individuals who were poor at delaying gratification

as preschoolers, and showed sustained difficulties in self-control in their twenties and thirties, continued (in their mid-forties) to show difficulties in withholding responses to attractive stimuli (happy faces). As noted earlier, this stability of individual differences in the ability to resist temptation suggests the importance of genetic rather than environmental influences. Consistent with this proposal, in their recent review of school-based EF interventions, Diamond and Lee (2011) concluded that working-memory performance is much more malleable than inhibitory control; indeed, none of the interventions was successful in improving children's ability to delay gratification.

However, before concluding that children's ability to delay gratification is not affected by variation in environmental factors, it should be noted that all of the studies considered in Diamond and Lee's (2011) review involved children aged 4 or above. Thus, it may simply be that environmental influences on children's ability to delay gratification are especially important in the first few years of life. Indeed, marked cultural contrasts have been reported for very young children's abilities to delay gratification, with children from collectivist cultures typically outperforming children from individualistic cultures (Lan, Legare, Ponitz, Li, & Morrison, 2011; Lewis et al., 2009).

More directly, within-sample variation in young children's abilities to delay gratification is associated with both maternal education (Jones, Rickel, & Smith, 1980) and authoritative (rather than permissive) maternal style (Mauro & Harris, 2000). Authoritative parenting is composed of three primary dimensions: *demandingness* (i.e., setting appropriate limits and having high expectations), *responsiveness* (i.e., responding appropriately to children's needs with warmth and support), and *autonomy-support* (i.e., permitting and actively encouraging children's autonomy and independence in appropriate contexts) (Maccoby & Martin, 1983, as cited by Mattanah et al., 2005). Findings from studies that assess each of these dimensions separately indicate that it is maternal responsiveness, rather than limit-setting, that predicts individual differences in children's delayed gratification performance (Houck & LeCuyer-Maus, 2004; LeCuyer-Maus & Houck, 2002; Raver, 1996). Consistent with this view, in a detailed observational study of 30-month-olds, children who refrained from touching a prohibited toy had mothers who were more likely to use distraction as a technique to assist in their children's regulation than were mothers of touchers (Putnam, Spritz, & Stifter, 2002). These authors also concluded that proactive, rather than reactive, parental strategies are needed to foster children's ability to delay gratification. Interestingly, in a study in which mothers were asked to predict the

effectiveness of different parental strategies for supporting children during a frustrating delay, such as that experienced by children completing the delay of gratification task, Hom and Knight (1996) found that mothers typically failed to recognize distraction as an effective strategy and were more likely to endorse incentive-focused techniques. Together, these studies suggest that interventions that foster parents' awareness of meta-cognitive strategies (such as distraction) may help to improve young children's ability to resist temptation when required. However, this hypothesis has yet to be tested directly.

Findings from three further studies also emphasize the importance of interactions between child and maternal factors as predictors of performance on delay of gratification tasks. With regard to child characteristics, Jacobsen et al. (1997) found an interaction between attachment security and children's cognitive ability as predictors of delayed gratification performance at age 6: insecure-avoidant attachment was unrelated to delayed gratification among more able children, but predicted poor delayed gratification among average or less able children. Likewise, Razza, Martin, and Brooks-Gunn (2012) found that high maternal warmth was only associated with good delay of gratification for children who, as infants, were rated (by mothers) as showing high levels of anger. These findings echo reports that fearless temperament and callous-unemotional traits moderate the success of maternal disciplinary strategies for socializing children (Dadds & Rhodes, 2008; Kochanska, 1995; Viding, Fontaine, Oliver, & Plomin, 2009). To our knowledge, however, these child characteristics have not been examined directly in relation to performance on delayed gratification tasks.

With regard to maternal characteristics, Sethi, Mischel, Aber, Shoda, and Roderiguez (2000) reported that distancing strategies among toddlers with controlling mothers and, conversely, proximity-seeking strategies among toddlers with non-controlling mothers predict delay of gratification at age 5. This finding echoes recent reports that secure attachment relationships can buffer children at genetic risk for poor frustration control (Kochanska, Philibert, & Barry, 2009). Note also that, just as maternal use of physical discipline shows contrasting associations with child problem behaviors for European versus African American families (Deater-Deckard & Dodge, 1997), the influence of specific family processes on children's abilities to delay gratification are likely to be culturally specific; exploring cultural contrasts in the nature of parental influences on children's self-control is an important avenue for future research.

Can Parents Support EF Development in Middle Childhood?

In contrast with the above-described substantial body of work on parental scaffolding of very young children's regulatory skills, only a few studies (e.g., Mattanah et al., 2005; Nader-Grosbois, Normandeau, Ricard-Cossette, & Quintal, 2008; Pratt, Green, MacVicar, & Bountrogianni, 1992) have considered how parents might scaffold goal-directed activities in older children. This gap in the literature is significant because, as children grow up and encounter tasks that are more complex and less familiar to adults, assuming the role of an expert tutor becomes more difficult, so that individual differences in parental scaffolding efficacy are likely to become even more striking (Gleason & Schauble, 1999). Indeed, for subjects such as mathematics (for which there are particularly marked contrasts in parents' understanding and confidence) marked inequities have been reported in parental resources available to support children's learning (Hyde, Else-Quest, Alibali, Knuth, & Romberg, 2006).

All of this is relevant to the current chapter, as there is now compelling evidence that individual differences in children's academic performance (especially in mathematics) are strongly related to variation in EF skills (Blair & Razza, 2007; Gathercole & Pickering, 2000; Lan, Legare, Ponitz, Li, & Morrison, 2011; Mazzocco & Kover, 2007; McClelland et al., 2007). Moreover, although accounts of income-related achievement gaps often focus on contrasting opportunities for cognitive enrichment (e.g., books, music lessons, trips to museums and libraries) (Prior, Bavin, & Ong, 2011; Sarsour et al., 2011), there is increasing recognition that income-related contrasts in parental support for children's self-regulatory (i.e., EF) skills also matter. Adopting Mischel et al.'s (1989) delayed gratification paradigm, Evans and Rosenbaum (2008) conducted two studies that showed that self-regulation did indeed mediate the prospective relation between family income and school-aged children's cognitive development. Moreover, in the second study (which involved a large NICHD sample) self-regulation and cognitive enrichment were each significant and independent predictors of the income–achievement gap. This finding has clear practical implications, as it suggests that interventions that focus simply on cognitive enrichment will be less effective than those that also help low-income parents to teach children strategies for coping with frustrating delays and for planning efficient solutions to cognitive tasks.

Moreover, in one of the few observational scaffolding studies to involve older children, Mattanah et al. (2005) found that sensitive parental scaffolding (especially in mothers) predicted children's later general academic performance, even when variation in both authoritative parenting and children's earlier mathematical performance were taken into account. Their findings also supported early claims that scaffolding improves children's motivation (e.g., Wood, Bruner, & Ross, 1976); this suggests that a useful goal for future research would be to explore the independence and interplay between parental influences on "hot" (motivational) and "cool" (cognitive) aspects of children's EF. As Mattanah et al. (2005) themselves note, the significance of their study findings is, however, limited by both the specific challenges of the (long division) task used to observe scaffolding and by the fact that their sample consisted primarily of highly educated parents and children with above-average abilities; anecdotal findings from this study and more systematic findings from other studies (Evans, Xu, & Lee, 2011; Gleason & Schauble, 1999; Hyde et al., 2006) both indicate that less educated parents are less likely to adopt scaffolding strategies to foster their children's self-regulatory skills. This point brings us to the next section of this chapter, which considers how adverse factors (such as poverty or poor maternal mental health) can constrain and impede the development of young children's EF skills.

Family Risk Factors for EF Development: Maternal Depression and Family Chaos

Above, we outlined the variety of ways in which parents support their children's EF skills development. Here, we ask how children's EF development is affected when this support is missing. Two studies have addressed this question quite directly, by examining the impact of *parental absence* on children's EF development. In the first, Sarsour et al. (2011) examined 60 American low SES families with 8- to 12-year-olds and showed that children living with a single parent performed more poorly in all three EF domains (inhibitory control, cognitive flexibility, and working memory) than those living with two parents. In the second study, Hewage, Bohlin, Wijewardena, and Lindmark (2011) assessed inhibitory control and working memory in 66 Sri Lankan 11-year-olds and found that those whose mothers had been working abroad for more than a year performed less well than those

whose mothers were employed in Sri Lanka; moreover, poor inhibitory control mediated the relationship between maternal absence and externalizing behavior.

Each of the above studies also included in-depth analyses of parental behaviors that promote children's EF development. Sarsour et al. (2011) reported specific mediation effects: parental responsivity and family companionship partly mediated the relationship between SES and child inhibitory control, while enrichment activities and family companionship mediated the relationship between SES and working memory. Hewage et al. (2011) found that, despite receiving more opportunities and materials for learning, children whose mothers worked abroad also received lower levels of parental responsivity, encouragement of maturity, and family integration (assessed using the HOME inventory). Total scores on the HOME were associated with both inhibitory control and working memory performance. Emotional climate mediated the relationship between parental absence and poor inhibitory control, but no other mediation effect was statistically significant. Thus, analyses of family predictors of children's EF skills should differentiate between parental emotional availability and overall level of family functioning; these two factors are discussed in more detail below.

Maternal Depression

Parental responsivity, companionship, scaffolding, emotional availability all highlight the active nature of parenting. Parenting can be challenging for parents, especially those with depressive symptoms. Problems of depression are very common in mothers with young children: antenatal depression affects between 7% and 20% of expectant mothers (Lee, Chong, Chiu, Lam, & Fong, 2007) and about 10% to 15% of newly delivered mothers report clinical levels of depression at 3 months postpartum (Gavin et al., 2005). This prevalence is worrying, as depressive symptoms undermine parenting in several ways, being associated with: activation of low-positive and high-negative emotion, reduced child-oriented goals and attention to child input, and increased negative appraisals of children and parenting competence, coupled with increased positive evaluations of coercive parenting (Dix & Meunier, 2009). In short, depression in mothers is associated with reduced ability to generate effective and complex strategies of action (Dix & Meunier, 2009; Gotlib & Hammen, 1992), constraining mothers' abilities to offer appropriate scaffolding and support. This view is supported by the finding

that maternal fatigue (a hallmark of depression) is related to problems of inattention and impulsivity in school-aged children (Elgar, McGrath, Waschbusch, Stewart, & Curtis, 2004).

As noted earlier, a separate body of work has shown that depressed individuals display significant impairments in executive function, which may mediate the impact of maternal depression on the quality of mothers' interactions with their children. Direct evidence for a specific relationship between poor working memory and harsh reactive parenting comes from a recent study by Deater-Deckard, Sewell, Petrill, and Thompson (2010) in which 216 mothers of 6-year-old same-sex twins completed verbal, spatial, and working-memory subtests of the Wechsler Adult Intelligence scale and were observed working individually in two frustrating cooperation tasks with each of their children. Observational ratings of reactive harsh parenting were related to mothers' poor working memory performance but not to poor verbal or spatial ability. This finding highlights the demands of authoritative parenting on effortful higher order cognitive processes (Barrett & Fleming, 2011). What is not yet known is whether there is an interplay between the adverse effects of depression and poor working memory on mothers' parenting. For example, do impairments in working memory mediate the impact of depression on care-giving behaviors? Beyond this question, further work is needed to examine whether maternal depression can adversely affect children's EF skills more indirectly, for example through reduced motivation for maintaining routines and child-oriented activities. This proposal has yet to be tested directly, but is supported by findings (discussed later in this section) that family chaos predicts poor EF in children.

At this point it is worth noting that surprisingly few studies have actually examined whether maternal depression is associated with poor EF in children. Moreover, the few studies that have examined associations between mothers' depression and child EF have yielded inconsistent findings. Two studies of older children and adolescents showed no difference in EF between children with depressed versus non-depressed mothers (Klimes-Dougan, Ronsaville, Wiggs, & Martinez, 2006; Micco et al., 2009). Similarly, no significant group differences were found in a longitudinal study of very young children from low-income families that used latent class analyses to compare EF in children with "stressed and depressed" versus "low-risk" mothers (Rhoades, Greenberg, Lanza, & Blair, 2011).

That said, the null findings reported in the above three studies may reflect their common adoption of a categorical approach to depression; with one exception (Li-Grining, 2007), more positive findings have emerged from

studies that adopted a continuous approach. For example, in the NICHD Early Child Care Research Network's (1999) birth-cohort study, mothers' reports of depressive symptoms (obtained at 1, 6, 15, 24, and 36 months) were inversely related to cognitive-linguistic functioning. Likewise, Hughes and Ensor (2009b) reported that EF performance in a socially diverse sample of 190 4-year-olds was inversely related to mothers' concurrent depressive symptoms, even after taking into account variation in maternal education. Furthermore, a subsequent study that followed the same sample of children from age 2 to age 6 found that both exposure to mothers' depressive symptoms at age 2 and improvements in mothers' depressive symptoms over time predicted EF at age 6, even when accounting for the effects of age 6 verbal ability. The effects remained significant after age 2—working memory, maternal education, and direct observations of maternal positive control at ages 2 and 6 were included (Hughes, Roman, & Ensor, 2013). The relationship between improvements in maternal wellbeing and children's EF at age 6 is particularly noteworthy for health professionals and educators, as it indicates that interventions can be beneficial, even beyond the first few years of life.

At this point, it is worth noting that studies of both infants (for a review, see Field, 2010) and older children (Melchior et al., 2009) demonstrate that maternal depression also affects safety practices and child-oriented routines and activities, such that its impact on children's EF skills is likely to be both direct and indirect (cf., Dix & Meunier, 2009). To address the second of these pathways, below we review the literature on family chaos and children's EF.

Family Chaos

The confusion associated with chaotic homes places children outside a zone of support and security, with fewer opportunities to practice self-regulation (Evans, Gonnella, Marcynyszyn, Gentile, & Salpekar, 2005; Matheny, Wachs, Ludwig, & Phillips, 1995; Repetti, Taylor, & Seeman, 2002). Consequently, in chaotic environments, children's immediate goals may be to filter out the high levels of stimulation, but this may also result in the filtering out of developmentally facilitative stimulation (Robinson et al., 2009). Empirical support for the negative impact of overstimulation comes from the finding that just 9 minutes exposure to a fast-pace cartoon (Sponge Bob Square Pants) impaired 4-year-old children's EF abilities, compared

with matched peers who watched a more gently paced educational cartoon or who spent the 9 minutes in a drawing activity (Lillard & Peterson, 2011).

There is also evidence that family chaos adversely affects children's EF development on a longer time scale. For example, in the same study that showed that maternal scaffolding at age 2 predicted gains in children's EF performance from ages 2 to 4, Hughes and Ensor (2009a) also showed a specific independent predictive effect of family chaos, as indexed by mothers' responses to the CHAOS questionnaire (Matheny et al., 1995). Similar findings have also been reported for older children. For example, in a study of 233 predominantly low-income children who completed a delayed gratification task at age 9 and were asked to report on their own self-control 3–4 years later, Evans et al. (2005) found that the adverse effects of poverty on children's self-control were at least partly mediated by exposure to chaotic living conditions.

Family chaos is, of course, related to several indicators of poor parenting including: reduced responsiveness and scaffolding in parent–child interactions (Wachs, 1993); less calm parental responses (Valiente, Lemery-Chalfant, & Reiser, 2007), increases in paternal favoritism toward individual children (Atzaba-Poria & Pike, 2008), and inconsistent parenting (Hughes & Ensor, 2009a). The co-occurrence of family chaos and poor parenting implies that these two risk factors could mutually reinforce their adverse effects on child EF. One positive implication of this is that improvements in the quality of parenting may be particularly beneficial for children's EF in the context of high-risk, overstimulating environments. Compelling evidence for a moderating role of parenting in the relationship between family chaos and child EF comes from a recent study of 4- to 7-year-olds and their parents who were seen during a stay at an emergency shelter for the homeless (Herbers et al., 2011). Importantly, this study showed not only that homeless children exposed to high-quality parenting had higher EF than other homeless children, but also that EF mediated the relationship between high-quality parenting and academic achievement. In other words, in homeless families, the augmentation of children's EF skills via high-quality parenting has beneficial spillover effects in other areas of child functioning.

Conclusions and New Directions

This chapter opened with an outline of the challenges that face all researchers investigating parental influences on children's development. These include:

the need to tease apart genetic and environmental influences (coupled with ethical constraints on experimental work), individual variations in children's susceptibility to both positive and negative environmental influences (highlighted in descriptions of children as "orchids" or "dandelions," Boyce & Ellis, 2005), and nonlinear effects that, alongside the reduced power provided by indirect (questionnaire) measures of parenting, amplify the need for large and diverse samples. Despite these challenges, findings from studies of parental influences on children's self-regulatory skills (indexed either behaviorally or through experimental tasks) show a reassuring convergence, both internally and in relation to studies of parental influences on other child outcomes.

For example, studies of both preschoolers and school-aged children indicate that socioeconomic contrasts in parental scaffolding of children's self-regulatory skills help explain the achievement gap between children from affluent and disadvantaged families. Interestingly, parental views on the utility of different strategies for helping children in situations that require high levels of self-control are at odds with the evidence from research; for example, Hom and Knight (1996) report that distraction strategies work well, but are rarely mentioned spontaneously by parents. Together, these findings suggest that communicating the effectiveness of meta-cognitive strategies (such as distraction) to parents may be a simple but effective means of improving EF skills (and hence school readiness and academic achievement) in children from disadvantaged families.

Another point of convergence is that several independent studies of preschoolers support the conclusion that effective scaffolding of children's EF skills hinges on parental responsivity rather than limit-setting. This finding echoes conclusions from research that highlights the importance of connected mother–child conversations for children's developing understanding of mind (Ensor & Hughes, 2008). Moreover, this emphasis on joint attention and responsiveness is bolstered by findings from two further studies that indicate that child language skills mediate the relationship between scaffolding and EF (Landry Smith, & Swank, 2003; Matte-Gagné & Bernier, 2011). Together, these results highlight the importance of considering parental influences on children's EF skills alongside parental influences on children's linguistic and sociocognitive competencies.

A further theme to emerge from the literature is that both child and parental characteristics moderate the relationship between parental scaffolding and children's EF skills. From a policy perspective, this point has important implications, as it highlights the importance of tailoring

interventions to specific groups (e.g., children with poor emotional control, or children with mothers who show high levels of controlling behaviors). Once again, this conclusion echoes results from the related literature, such as the importance of reward- rather than punishment-based disciplinary strategies for improving conduct problems in children who are fearless or show high levels of callous and unemotional traits. That said, there are important gaps in our understanding. In particular, studies of preschoolers and older children have typically been conducted separately using distinct methodologies, so that it is not known whether parental scaffolding matters more for younger or older children. Likewise, although it seems likely that the impact of parental scaffolding on children's EF skills will be culturally specific, cross-cultural comparisons of children's self-regulatory skills have yet to address this question.

In contrast with the relatively large number of studies on parental scaffolding, relatively little is known about how EF in children is affected by family risk factors such as parental absence or depression and family chaos. In accord with the findings from two studies that examined the impact of parental absence on children's EF skills, this rather sketchy literature was considered in two parts, which focused on the importance of: (a) emotional unavailability as a consequence of maternal depression; and (b) family chaos. One conclusion to emerge from this literature is that depression in mothers is associated with reduced ability to generate effective and complex strategies of action, constraining mothers' abilities to offer appropriate scaffolding and support. Depressed adults show impaired EF themselves, but it is not known whether deficits in EF mediate the impact of maternal depression on the quality of mothers' interactions with their children. More importantly, relatively few studies have actually examined whether maternal depression predicts poor EF in children, and the findings from the few exceptions are inconsistent (although this may partially reflect between-study contrasts in how depression is measured).

Maternal depression can also affect children indirectly. Although evidence to support this claim with regard to children's EF skills is still lacking, there is growing evidence that family chaos impedes EF development in both preschoolers (e.g., Hughes & Ensor, 2009b) and school-aged children (e.g., Evans et al., 2005). In seeking to understand the nature of this effect, researchers consistently note that children in chaotic homes are often bombarded by stimuli (e.g., Evans et al., 2005). In other words, both environmental enrichment and chaos imply heightened stimulation, which is likely to prime children's physiological reactivity to stress (Ellis,

Essex, & Boyce, 2005). Why is it, then, that children in supportive environments have high EF, while children in chaotic environments are less well regulated? One reason may be that supportive environments enable children to show faster physiological recovery from stress and hence are more likely to develop prefrontal cortex connectivity associated with reflective self-regulation (Dickerson & Kemeny, 2004). In contrast, children in unsupportive environments display heightened physiological responses to stress but lack afferent recovery, such that stress may "take the prefrontal cortex offline" (Blair, Raver, Granger, Mills-Koonce, & Hibel, 2011). The detrimental effects of overstimulation outside the context of scaffolding or in unsupportive environments are well illustrated by recent findings that 4-year-olds' EF performance is adversely affected even by very brief exposure to fast-paced television cartoons (Lillard & Peterson, 2011).

Of course, family chaos and poor parenting will often co-occur and are likely to have mutually reinforcing adverse effects on child EF. Thus, interventions to promote positive parenting may be particularly beneficial for children from high-risk, overstimulating environments. As outlined in this chapter, the evidence base for designing effective interventions to foster parental support for children's EF development is growing. In turn, findings from future intervention studies offer a promising avenue for refining our understanding of the multiple ways in which parents can influence the growth of EF skills in children: this is likely to be a very fruitful research field in years to come!

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9

The Nature of Effective Parenting
Some Current Perspectives

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Parenting is effective when it facilitates the child's socioemotional development: that is, when it enables children to make a maximal contribution to society and, at the same time, to lead a relatively satisfying life. Good parenting is multifaceted, revealing itself in many ways. A major point to be made in this chapter is that these different good ways of parenting have different outcomes. An analysis of parenting, then, must include the fact that there are various ways of parenting well and a variety of outcomes related to these ways.

A second theme to be pursued is that effective parenting behavior does not simply involve specific actions that have the same impact on every child. The same action can be perceived differently by different children, or even by the same child at different points in time. Children actively interpret their parents' teaching, choosing what to accept and what to reject, as well as make judgments about parent intention, fairness, and so on (Grusec & Goodnow, 1994; Kuczynski, 2003; Smetana, 2011). Accordingly, an analysis of effective parenting must take into account the way a given parenting action is viewed by the child, with this view affecting the child's willingness to accept the parent's point of view and teaching actions. It becomes essential, then, to understand the meaning a child assigns to a parenting action in order to understand the impact of that action.

In what follows we will develop these two main themes. Before that, however, we briefly acknowledge some other features of parenting which, because of space limitations, will not be pursued at greater length. First, we note that parenting does not occur in a vacuum, in that parents do not act only in a conscious and deliberate way, unaffected by events in the environment or by their own history and makeup. Parents, and parenting behavior, are directly affected by stress in the workplace, financial strain, and features of children themselves (Conger & Dogan, 2007; Kuczynski, 2003; Repetti, Robles, Reynolds, & Sears, 2012), as well as by parents' own personality and behavioral and cognitive predispositions. The focus in this chapter, however, will be on what research suggests parents can do optimally in order to achieve their parenting goals.

Second, we observe that studies of parenting most frequently involve families with a mother and father. But families increasingly come in different forms, including those involving two parents of the same sex or one individual who is solely responsible for the parenting task. There is a growing literature on the impact of same-sex parenting on children's social and emotional development (Patterson & Hastings, 2007). This literature leads to the conclusion that children raised in families with parents of the same sex are as well off, or sometimes even better off, than children raised by a mother and a father. The picture is somewhat less positive in the case of single-parent families, where economic and time pressures are, on average, greater than in two-parent families. The stress produced by these variables can interfere with the successful process of parenting.

Finally, it should be noted that the largest part of research on parenting is conducted with mothers. Yet mothers do behave differently from fathers (Pleck, 2012). Where information is available about differences between mothers and fathers, this will be discussed.

The Requirements of Parenting

There are certain basic requirements for parenting. Children must be kept safe and healthy. Their socioemotional wellbeing (which includes a sense of self-efficacy and a reasonable degree of self-esteem) must be promoted. They need to be encouraged to be reasonably compliant, which, if nothing else, makes family life tolerable for all. Finally, they must be socialized, that is, helped to behave in accord with moral and social conventional standards of society (and to question those standards where appropriate).

Effective socialization involves two features: the imposition of structure or rules of conduct, which can be achieved either through the administering of consequences for failure to follow rules, direct tuition, or the provision of exemplars of appropriate conduct, and the development of some form of relationship which will promote adherence to the rules. An important feature of structure or the imposition of rules is that the child's feelings of autonomy or freedom of choice not be threatened (Roth, Assor, Niemic, Ryan, & Deci, 2009; Grolnick, Deci, & Ryan, 1997). These different ways of socializing children are highlighted in the discussion of domains of socialization below.

The Specificity of Socialization

At the beginning of this chapter we observed that parenting is multifaceted: Parents can be good at, or choose to use, some sorts of parenting strategies and not be good at, or choose not to use, others. Moreover, and most importantly, different forms of positive parenting are predictive of different kinds of positive child outcomes. As well, of course, different forms of negative parenting are linked to different negative child outcomes. To say that effective parents must be responsive to their children, or must not engage in harsh parenting, then, is far too imprecise and vague.

The Nature of "Responsiveness"

Consider, for example, the concept of responsiveness. An increasing body of evidence indicates that there are many different kinds of responsiveness and that they are associated with many different child outcomes. Landry, Smith, and Swank (2006), for example, distinguished four forms of parental responsiveness to infants: acceptance of the infant's needs, positive affective input, support for the infant's foci of attention, and conversation. They found that these different forms of responsiveness were not intercorrelated and that they predicted different child outcomes. Similarly, Bornstein, Tamis-LeMonda, Hahn, and Hayes (2008) distinguished among maternal affirmations, description, and imitation/expansions as reactions to infant bids for attention, finding that they were not intercorrelated and that they had different developmental trajectories. In a study of mothers in six countries, Bornstein (2012) identified six maternal behavioral caregiving domains—nurture, physical, social, didactic, material, and language—and five corresponding developmental areas—physical, social,

exploration, vocalization, and distress communication. Notable was the fact that mothers in all countries differed in the frequency with which they exhibited the behaviors in each domain, as well as that there were specific relations between each maternal caregiving action and individual child outcomes. For example, regardless of country, mothers who engaged their infants socially had infants who paid greater attention to them, and mothers who were more didactic had infants who explored objects and events in their environment more closely.

As a final example of different forms of responsiveness, Leerkes, Weaver, and O'Brien (2012) distinguished between maternal responsiveness to distress and to nondistress in their infants, with the former, but not the latter, predicting security of infant attachment. Moreover, these two aspects of responsiveness had different antecedents, with responsiveness to distress predicted by maternal emotional and cognitive reactions to distress and responsiveness to nondistress predicted by demographic characteristics including income and education.

Goals of Parenting

In addition to socializing different contents or outcomes, parents also have different goals when they interact with their children, goals that determine what sorts of interventions they need to employ. In this case, what is effective depends on whether or not it produces the outcome that the parent desires. Parents may wish to teach important values or customs, they may want to obtain obedience and short-term compliance, or they may wish to promote positive feelings and psychological adjustment in their child (Dix, 1992). Accordingly, they employ different strategies that serve their goal.

In a study of the impact of goals on parenting behavior, Kuczynski (1984) asked parents to prepare their children to perform a sorting task either when the parent was in the same room or after the parent had left the room. In the latter instance, where the goal was long-term, mothers were more nurturant, offered more explanations, and made more positive statements about their children's character than they did in the former instance where the goal was a short-term one and where the child would be under their surveillance. In another investigation, Hastings and Grusec (1998) interviewed parents about a recent difficult interaction they had had with their child, asking them to describe the event and to say how they handled it, as well as what it was they were trying to achieve. Parents reported three kinds of goals: parent-centered, child-centered, and relationship-centered and, within each

goal, whether it involved a short-term or long-term outcome. Sometimes, then, parents simply wanted to change children's current behavior, as in getting them to go to bed or to behave better in a public place (parent-centered, short-term). Sometimes they wanted to teach them a value or important lesson (child-centered, long-term), and sometimes they wanted to reach a fair and equitable solution that would make everyone happy (relationship-centered, short-term). Importantly, different interventions were associated with each of the relationship goals. When their goals were parent-centered, parents tended to threaten punishment and act in a negatively controlling way. When their goals were child-centered, reasoning was the predominant approach. And when the goals were relationship-centered, parents would share control by negotiating in a context of warmth. Hastings and Grusec (1998) also reported differences between mothers and fathers in the goals they favored, with mothers more likely to endorse relationship-centered ones than were fathers.

Domains of Socialization

Another approach to the parsing of parenting actions involves a focus on the nature of the relationship between parent and child that is currently activated (Bugental, 2000; Grusec & Davidov, 2010). These relationships take place in recurring contexts and have specific aims, mechanisms, and outcomes. The domain of interaction is determined by the parent and the child in the interaction and a mismatch in domain between the parent and the child can lead to ineffective parenting efforts.

Grusec and Davidov (2010) proposed five domains: protection, reciprocity, control, guided learning, and group participation. In the protection domain the parent is a caregiver, providing a safe environment for the child. This domain is activated when the child is hurt, ill, emotionally upset, or in physical danger. When parents respond appropriately by removing the source of distress, comforting, or teaching their children to self-comfort, children become securely attached, trusting that others have their best interests at heart and being able to deal with their own distress (Ainsworth, Blehar, Waters, & Wall, 1978). As well, they learn to respond to stress in others through development of an empathic capacity that helps them to behave in a prosocial or helpful way to those others as well as not to cause them harm. And, finally, children who have been kept safe by their parents are more likely to comply with the requests of their parents, particularly if those requests

involve their wellbeing, because they trust them to be focused on that wellbeing (Eisenberg, Fabes, & Spinrad, 2006; Grusec & Sherman, 2011).

In the domain of reciprocity parent and child are in a relationship of equality. When parents comply with reasonable requests and bids for attention from their children, their children, in turn, are more likely to comply with their parents' request (Kochanska, 1997; Parpal & Maccoby, 1985). Play interactions and other positively affective interactions thus facilitate children's compliant behavior and willingness to share the goals of others.

In the control domain the relationship is a hierarchical one, with an authority figure utilizing his or her greater control over resources to gain children's compliance when they would prefer not to give it. The challenge in this domain is to obtain compliance without producing feelings of coercion in the child that can lead to reactance and anger (Hoffman, 1970). It has been argued that one way to obtain feelings of freedom of choice is to impose modest levels of control accompanied by appropriate reasoning (Lepper, 1983). Under these circumstances, children comply not because they fear punishment or hope for reward, but because they attribute their compliant behavior to personal choice or to adherence to moral principles that are seen as self-generated or internalized. It is in this domain that children learn to inhibit antisocial action and to adhere to rules of behavior.

In the fourth domain, that of guided learning, the relationship is one of teacher and student. Working within the child's zone of proximal development, parents engage children in learning about appropriate ways of behavior and thinking. Talking about emotions and how to deal with them, for example, has been shown to improve emotion self-regulation and understanding (Gottman, Katz, & Hooven, 1996; Laible & Panfile, 2009). Parents also teach their children how to interact with peers in a socially skilled way, with such teaching predictive of greater social competence (Ladd & Pettit, 2002; McDowell & Parke, 2009). As well, moral reasoning is acquired through a process of guided learning (Turner & Berkowitz, 2005).

Finally, children are socialized in the group participation domain, where they and their parents are individuals with membership in the same social group, with the former assisting the latter to identify what their shared social identity entails. Parents provide models of socially acceptable behavior as well as protecting their children from exposure to what they consider to be unacceptable behavior. Through rituals and routines, as well as observational learning, children learn to behave in socially conventional ways that help them to become accepted members of the group.

Summary and Conclusion

In summary, researchers are increasingly finding that good parenting cannot be characterized as falling along some single dimension. Parenting actions need to be matched to the outcome desired. Responding to an infant's distress will not facilitate exploration of objects in a child's environment, nor will it be closely linked to internalization of moral values. When parents attempt to gain immediate compliance with their wishes, negotiation is not the best approach. And parents need to understand the socialization domain in which their child is currently operating and act accordingly. Thus, for example, when a child misbehaves, it is important to know the reasons for that misbehavior. Is it because the child is in distress and, therefore, needs comfort and reassurance? Or does the child not know the proper behavior in the situation and needs to learn? Has the child been exposed to antisocial models so that greater care must be exercised in limiting or prohibiting exposure to such models? Does the child know what proper behavior is and only needs pressure or motivation to behave better? Or, perhaps, the parent is not generally very responsive to or accommodating of the child's desires and wishes and needs to set up a more cooperative relationship with the child. Each domain requires a different approach in order for parenting to be effective.

The Meaning of Parenting Actions

In the second part of this chapter we address the issue of meaning and the fact that the same parenting actions are interpreted differently by different children as well as differently by the same children at different points in time. We begin with a discussion of parenting styles and discipline techniques because these are the areas of research investigation from which considerable information about the importance of meaning has emerged.

Parenting Styles and Discipline

One of the most influential and productive approaches to the study of parenting has come from the work of Diana Baumrind (1967, 1971, 2012). Indeed, it is impressive that, more than 40 years later, researchers continue to use her classification of parenting styles as a way of labeling particular approaches to parenting, particularly parenting in what is described above

as the control domain. Baumrind distinguished between authoritarian or rule-driven and harsh parenting, authoritative or firmly controlling but responsive parenting, and permissive or laissez-faire parenting, with each of these styles associated with its own particular set of socioemotional outcomes. Overall, it was the authoritative parenting style that predicted the best outcomes, including acceptance of parental directives. In elaborations of Baumrind's approach, researchers more recently have distinguished between psychological and behavioral control, with the former entailing attempts to influence the child's emotional state (e.g., guilt induction) and the latter the setting and enforcement of reasonable rules for behavior. Psychological control is associated with internalizing problems such as depression and low self-esteem, whereas behavioral control is associated with reduced levels of antisocial behavior (Barber, 2002).

Another distinction that has also had impressive staying power is Martin Hoffman's (1970) identification of power assertion (e.g., withdrawal of privileges, threats of punishment) and reasoning in the discipline (control) situation, and his conclusion that the use of reasoning, accompanied by minimal levels of power assertion, results in higher levels of conscience development.

Moderators of Parenting Style and Parenting Discipline

There are problems, however, with the argument that good parenting is authoritative or not psychologically controlling, or that good parenting in a discipline situation requires the utilization of reasoning accompanied by minimal amounts of power assertion. Essentially, a number of variables act as moderators of the effect of parenting style and of discipline. Age of child and sex of child and parent, for example, have an impact on the outcomes of the same form of parenting: Coercive and insensitive discipline strategies are more strongly linked to antisocial behavior in school-aged as opposed to younger children and in preadolescent boys as opposed to preadolescent girls (Rothbaum & Weisz, 1994). Psychologically controlling parenting by fathers increases relational aggression more among girls than among boys (Kawabata, Alink, Tseng, van IJzendoorn, & Crick, 2011). The nature of the child's transgression also affects the outcome of discipline, with reasoning and severity of punishment needing to be appropriately matched to the child's deviation: High levels of power assertion will have a more positive impact when children have hurt others physically or psychologically, for example, than when they have violated an essentially arbitrary social

convention (Smetana, 2011). Another moderator of discipline is cultural context, with authoritarian parenting appearing to be more harmful to children in Western European contexts than it is in other cultures where it is more normative and where it is employed as a training technique rather than being an expression of negative affect (Deater-Deckard, Dodge, Bates, & Pettit, 1996; Fung & Lau, 2009; Lansford et al., 2005).

One area of particularly intensive investigation has been that of temperament by parenting interactions: There is now a very large body of research that points to the centrality of children's temperament as a moderator of the effect of a given parenting intervention. This literature contributes significantly to an understanding of the apparently perplexing observation that two children in the same family who are parented similarly can still turn out very differently.

Temperament by parenting interactions.
Temperament is a biologically based, early-appearing, and relatively stable feature of the individual's response to emotional stimuli. It is frequently described as having three components: fearfulness or withdrawal and slow adaptation to novel situations, negative emotionality or irritability and negative reactions to discomfort or frustration, and self-regulation or high levels of effortful control. There is evidence both that parenting can modify temperament and that temperament can affect parenting, but also considerable evidence that temperament moderates or alters the impact of different kinds of parenting (Bates & Pettit, 2007). Most frequently the conclusion is that children with an easy temperament are less affected by poor parenting than are children with a difficult temperament, although there is also some suggestion that children with a difficult temperament may respond even more positively to good parenting than those with an easy temperament (Belsky & Pluess, 2009).

Most research addressing temperament by parenting interactions has focused on parental discipline in response to children's antisocial behavior or externalizing and internalizing problems. In an early study (Kochanska, 1997) conscience development was found to be negatively related to harshness of parental discipline in fearful children, but had no relation to that outcome in fearless children. Kochanska argued that fearful children become too anxious in the face of strongly negative parenting to process information about proper behavior. Other researchers have found that hostile and intrusive parenting is associated with externalizing problems in children with a difficult or irritable temperament but not in

children who have an easy temperament (e.g., Morris et al., 2002; Stice & Gonzales, 1998; Wills, Sandy, Yaeger, & Shiner, 2001). One explanation for this relation is that, when parents cannot easily control their children's behavior, parent and child become involved in coercive interactions that result in antisocial behavior, and that temperamentally difficult children are more prone to engage in these interactions than temperamentally easy ones. With respect to internalizing problems, these are reduced in children with a difficult temperament, as well as in those who are fearful, when parenting is highly controlling but not too negative, whereas such parenting has no effect on internalizing problems in children with an easy temperament or who are fearless (Arcus, 2001; Tschann, Kaiser, Chesney, Alkon, & Boyce, 1996). Here the suggestion is that mild frustration and challenge encourage children who are emotionally reactive to self-regulate. Finally, in the case of children who have difficulties in effortful control, hostile parenting promotes antisocial behavior (Morris et al., 2002).

Although the vast majority of studies suggest that poor parenting affects children with problem temperaments, there are some studies that indicate the opposite, that is, that children with problem temperaments may be protected with respect to certain outcomes from the adverse effects of poor parenting. Cornell and Frick (2007), for example, found that mothers who were inconsistent in their discipline (but not mothers who were authoritarian) had preschoolers who were less empathic if they were fearless. For fearful or behaviorally inhibited children, these two kinds of parenting did not relate to empathy. Chaparro and Grusec (2012) reported a similar finding, this time with adolescents and with longitudinal data. They found that adolescents who were low in behavioral inhibition (fearless) and whose mothers were inconsistent in their discipline were less empathic 2 years later than those with mothers who were consistent in their discipline. For fearful or behaviorally inhibited children, inconsistent discipline had no effect on empathy. In this case, then, fearfulness appeared to shield children from the effects of adverse parenting when the outcome of interest was feelings of sympathy or upset when someone else was experiencing distress.

Adding to the complexity of these interactions is the observation of Belsky and Pluess (2009), noted above, that children with difficult temperaments may respond particularly well to positive parenting. Very young boys with a difficult temperament, for example, had fewer externalizing problems when their mothers used negative control infrequently relative to those with an

easy temperament (van Aken, Junger, Verhoeven, van Aken, & Dekovic, 2007). And Lengua (2008) reported that children prone to negative emotion decreased in internalizing and externalizing problems relative to nonreactive children when their mothers were low in rejection.

In summary, then, harsh parenting increases the antisocial behavior or externalizing problems of fearful and difficult children, but not fearless and easy ones. Highly controlling but not negative parenting effectively reduces internalizing problems (such as anxiety and low self-esteem) in fearful and difficult children, but not fearless and easy ones. In contrast, inconsistent parenting makes fearless children less empathic but has no effect on the empathic capacity of fearful children. And, in some cases, children with a difficult temperament respond particularly well to noncontrolling and nonrejecting parenting relative to those with an easy temperament.

New Approaches

The existence of so many moderators of the impact of parenting has led to a focus on the meaning attributed by a child to the parenting intervention. For example, a child with a difficult temperament, or a boy, might see strict parenting as a sign of rejection, whereas a child with an easy temperament, or a girl, might be more inclined to interpret it as a sign of caring. Accordingly, an essential feature of parenting is knowledge of how the child interprets what the parent does and says. This knowledge includes awareness of whether the child understands the message the parent is trying to convey as well as awareness of the conditions under which the child is likely to be influenced by that message (Grusec & Goodnow, 1994). Grusec, Goodnow, and Kuczynski (2000) argued, therefore, that an essential feature of parenting was knowledge of the child's thinking: To be an effective agent of socialization a parent must be aware of how an intervention is perceived—whether it is seen as an expression of love and concern or rejection, as appropriate or inappropriate given the child's actions, as well-intentioned or not, as overcontrolling or not—and, of course, that the child understands what the parent wants.

A number of studies now exist that demonstrate the importance of parents' awareness of their children's perceptions of parenting interventions. We review these in three sections: demonstrations that knowledge is predictive of positive child outcomes, studies suggesting how knowledge affects parenting behavior, and research considering how parents become knowledgeable.

Knowledge Predicts Positive Child Outcomes

In an early study, Miller, Manhal, and Mee (1991) found that children of parents who could accurately predict their children's cognitive performance exhibited higher levels of cognitive performance. The researchers speculated that knowledge made the parents better able to match their teaching to the children's developmental level. They also found no difference between mothers and fathers in their levels of knowledge. In a study of conflict and discipline, Hastings and Grusec (1997) found that parents who were knowledgeable about their adolescents' cognitions and affect during the conflict reported more positive outcomes. Although there were no overall differences in the knowledge levels of mothers and fathers, there were differences in the outcome that was linked to knowledge. In the case of mothers, knowledge predicted their satisfaction with the outcome of the conflict and, in the case of fathers, knowledge predicted fewer conflicts. Interestingly, this finding accords with our earlier observation that mothers have more relationship-centered goals than fathers (Hastings & Grusec, 1998) and so it would seem that parents can use their knowledge to achieve their own specific goals. In a study of younger children, mothers were requested to ask their children to clean up a playroom. Some children protested, with mothers who more correctly identified their children's evaluations of different discipline techniques better able to ultimately gain their compliance (Davidov & Grusec, 2006).

Moving from the domain of discipline to that of helping children cope with their own distress and that of others, Vinik, Almas, and Grusec (2011) assessed mothers' knowledge of what their adolescents found comforting when they were upset. In this case, children of more knowledgeable mothers showed better levels of coping as well as more prosocial behavior (assisting others in need) in the classroom. The effects of this same form of maternal knowledge—knowing what children found comforting when they were upset—were shown to be related to coping in a longitudinal study, at least for children of mothers who reported some need for change in their children, suggesting a causal relation between knowledge and better coping (Sherman, Grusec, & Almas, 2012).

How Knowledge Affects Parenting Behavior

Knowing about children's thoughts, feelings, evaluations, and so on is a beginning for effective socialization. But parents must then engage in actions

that will promote better functioning on the part of their children. Sometimes they may not actually do this. Kiel and Buss (2010), for example, found that mothers who best predicted the reactions of their temperamentally fearful toddlers had children who became more fearful over time. The children of mothers who were less attuned, however, did not show this increase. Further, they found that knowledgeable mothers were overly protective, and that it was this overprotectiveness that, at least partially, mediated the link between early and later fearfulness. Mothers who were not good at predicting their children's behavior, in contrast, were less likely to respond to their children's distress with what was actually a counterproductive intervention.

Other evidence, however, indicates that knowledge can also promote effective socialization strategies. Davidov and Grusec (2006), for example, compared the behavior of two groups of mothers, those who were able to predict their children's evaluations of different forms of discipline and those who were not, when their children failed to comply with their request to clean up a playroom. Knowledgeable mothers were more likely to try a different approach whereas those who were less knowledgeable simply repeated the request or walked away, with the greater flexibility of knowledgeable mothers increasing their children's ultimate compliance with their request. In their study of adolescent coping Sherman et al. (2012), as noted above, found that knowledgeable mothers (those who predicted their children's ratings of how comforting they would find various maternal responses to their distress) who also reported that their children's behavior needed some modification had children who exhibited greater coping skills. The mothers who wanted to change their children's behavior but who were low in knowledge reported that they responded to their children's displays of negative affect with dismissive or punitive reactions. In contrast, the highly knowledgeable mothers who wanted to change their children's behavior responded with more positive reactions such as encouraging the expression of emotion and comforting. These two studies, then, suggest that what knowledge does is allow or encourage mothers to engage in more positive and/or flexible approaches when their children are displaying problematic behavior. Mothers who are less aware of their child's perceptions, on the other hand, seem to lack this sort of flexibility.

Of course, the direction of effect might run the opposite way. Parents who try different approaches may be more likely to be knowledgeable about what works to gain their children's compliance or to help them cope better, whereas parents who are more fixed in their approach never have the opportunity to learn about the usefulness of other approaches. Parents who

comfort their children would have more opportunities to learn what their children find comforting. It would not be surprising if the chain of causation ran in both directions, with knowledge leading to greater flexibility and greater flexibility leading to knowledge.

Sources of Knowledge

If knowledge is important in the promotion of effective parenting, then an important question has to do with the source of this information. One obvious source is listening to children and trying to take their perspective. Davidov, Grusec, and Wolfe (2012), for example, found that mothers who were authoritative were more likely to be knowledgeable about their children's evaluation of different discipline techniques than were authoritarian and permissive mothers. It would appear, then, that parental knowledge is greater when parents are firmly controlling but responsive to their children's wishes, certainly an optimal condition for learning about the way children think. A related source of information comes from a recent and extensive set of investigations about children's willingness to disclose information to their parents independent of parents' attempts to modify or control behavior.

Disclosure.
Monitoring of children's behavior is an important feature of effective parenting (for a review, see Crouter & Head, 2002). Monitoring has been conceptualized as requests for information from the child, engaging in activities together, and information obtained from other individuals (e.g., teachers, peers, and other parents) who interact with the child. In two influential papers, however, Kerr and Stattin (2000) and Stattin and Kerr (2000) pointed out that most studies had operationalized monitoring as knowledge and that knowledge comes in other ways than simply keeping watch on what children are doing. Specifically, they found that children voluntarily disclosed to their parents about their activities, and that this voluntary disclosure, at least in a sample of Swedish adolescents, was a better predictor of children's adaptive outcomes than parents' asking about or controlling their children's activities. Indeed, control was significantly negatively correlated with positive outcomes.

  Although there was disagreement about disclosure being the *best* predictor of children's positive behavior (Fletcher, Steinberg, & Williams-Wheeler, 2004), a great many studies have subsequently demonstrated that children's willingness to disclose is a major factor in effective socialization. Presumably

(in addition to the fact that children who disclose have less to hide) knowledgeable parents are aware of their children's problems and temptations and are able to help them deal with those problems and circumvent the temptations. This kind of knowledge, of course, is somewhat different from that we have been discussing up to this point: We have focused more on knowledge of children's cognitive and affective reactions to parenting behaviors, rather than knowledge of their friends and activities. Nevertheless it is not unreasonable that, in a context of feeling comfortable with sharing information with parents, children who disclose about their friends and activities may also disclose about their thoughts and feelings. Sherman et al. (2012), for example, found in a longitudinal study that adolescents who were high on the Kerr and Stattin measure of disclosure (telling parents about friends, school, and after-school whereabouts) had mothers who, 2 years later, were more knowledgeable about what their adolescents found comforting when they were upset. Importantly, this relation held when controlling for their knowledge at the first time point, suggesting that disclosure, in fact, was responsible for increased levels of maternal knowledge.

If disclosure is important in promoting knowledge, then effective parenting should include features that facilitate children's willingness to divulge information about themselves. Characteristics of parents are important, with parental authoritativeness, warmth, and support shown to be important predictors and antecedents (Almas, Grusec, & Tackett, 2011; Smetana, Metzger, Gettman, & Campione-Barr, 2006; Soenens, Vansteenkiste, Luyckx, & Goossens, 2006). In a qualitative study, Tokic and Pecnik (2010) interviewed Croatian adolescents about parental reactions to disclosure. Not surprisingly, the adolescents reported that they were more likely to disclose when their parents were accessible, disclosed themselves, recognized the adolescent's emotional states, and were in a good mood. Disclosure was inhibited when parents were not available, were reluctant to engage in conversation, did not understand or take the adolescent's disclosure seriously, and were punitive.

Summary and Conclusion

In summary, the fact that all children do not respond in identical ways to the same parenting action requires that an analysis of effective parenting take into account the meaning that a child assigns to a parenting action. Meanings are determined by a whole range of variables, ranging from the child's current mood to the cultural context in which the action takes place. Knowing

how children perceive an action, or the meaning they assign to it, requires encouraging children to talk about their cognitive and affective reactions to parenting strategies. Acceptance of these disclosures is important, as is a context of warmth and, of course, limit setting. Close attention to the child's nonverbal reactions would also seem to be part of the picture. We close this section with one final observation, and that is that mothers have greater awareness at least of their children's activities than fathers, because mothers get most of their information by asking directly, by being told things, and by just listening and observing whereas fathers rely mostly on their spouse for information (Crouter, Bumpus, Davis, & McHale, 2005; Waizenhofer, Buchman, & Jackson-Newson, 2004).

General Conclusion

The Internet, television, books, and magazines are full of advice about how to be an effective or successful parent. Unfortunately, the advice is not always consistent. Added to that is the fact that children are so different in how they respond to the same kind of treatment. One reaction to this state of affairs is to suggest that parenting has little impact on how children develop. Another, however, is to begin to unpack some of the complexities involved in effective parenting. In this chapter we have argued that identification of relations between specific kinds of parenting and specific child outcomes, as well as attention to the meaning children attach to the actions of their parents, is one way in which some of the complexities can be unraveled.

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10

Parenting and Early Intervention

The Impact on Children's Social and Emotional Skill Development

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There is broad consensus among early childhood researchers, policymakers, and practitioners that parenting is an influential determinant of a child's development, as well as a potent promotive factor in the development of psychosocial competence (Ayoub, Vallotton, & Mastergeorge, 2011; Belsky, 1984; Masten, 2001; Riley & Masten, 2005). More than those of any other species, human infants depend upon relationships with their caregivers to survive (Tobach & Schnierla, 1968), and it is within the context of these central relationships that the foundational aspects of individual social and emotional abilities emerge (Easterbrooks, Bartlett, Beeghly, & Thompson, 2012). Beginning at birth, children's increasing capacity to recognize self and other, to experience, express, understand, and regulate emotions, and to form interpersonal relationships are deeply rooted in their social environments (Belsky, 1984; Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006). The development of young children thus is inextricably linked to their social ecology, a notion captured in

Winnicott's (1960) famous dictum, "There's no such thing as a baby." From this standpoint, one cannot appreciate social and emotional development in childhood without considering the most salient of developmental contexts—parenting.

According to the Oxford Dictionary, the Latin derivation of the word *parenting* is *parere*, meaning, "to bring forth." With the aim of understanding how to "bring forth" a healthy, well-adjusted child, numerous investigators across multiple fields of practice (e.g., psychology, social work, medicine, anthropology, sociology) have sought to determine precisely what constitutes optimal parenting. This is a formidable task in light of diverse beliefs about child-rearing, behavior, and emotional expression that vary by cultural context and shift over historical eras. For certain, maintaining an open stance in relation to different ways of parenting in heterogeneous circumstances is essential, as "There is not likely to be One Best Way" (Rogoff, 2003, p. 12). Concomitantly, the science of early childhood has led to dramatic advances in understanding associations between specific parenting styles and young children's socioemotional health (Shonkoff & Phillips, 2000). For instance, the vast majority of parenting research to date converges around the notion that sensitive, responsive, consistent caregiving, beginning at birth, is the cornerstone of health across domains of development (Center on the Developing Child at Harvard University, 2010; Shonkoff & Phillips, 2000). On the other hand, scientists now have an appreciation for the fact that both the child and caregiver are shapers in socioemotional development (Brownell & Kopp, 2007; Schore, 2001). Just as a parent's ability to interpret and respond sensitively to an infant's cues affects relations between them, so too does the infant's level of arousal and dysregulation. In this way, caregiving is a "two-way street," and whether a parent's behavior impedes or enhances a child's social and emotional functioning depends largely on dynamic transactions within these first relationships (Belsky, 1984).

Dynamic skill theory provides a model for understanding the intersection of the components of social and emotional development that are divided into three domains—emotion regulation, emotion understanding, and attachment. Within the dynamic skill framework, development involves an individual's construction of progressively more complex skills. Skills are the activities or actions a person can control in a given context or situation and are organized into varying strands that build a developmental web (Fischer & Bidell, 2006). In contrast to historically favored linear models of development (e.g., Kohlberg, 1969; Piaget, 1983), the developmental

pathways approach of skill theory proposes that young children develop along a web of multiple strands, the shapes of which vary between children and are influenced by each child's context. Individuals' webs can be similar to one another, or may differ, depending upon both internal and external influences, but together they form the child's developmental pathway (Fischer & Bidell, 2006). An integrative pathways approach supports better understanding of the social behavior of young children facing social and economic risks because it portrays differences in performance as adaptive and complex rather than simply delayed or dysfunctional (Fischer et al., 1998).

In the chapter that follows, we provide specific examples of the powerful association between parenting and socioemotional functioning in early childhood. Exemplars include several key aspects of development: emotion regulation, emotion understanding, and attachment. However, we present current empirical findings in each area with the caveat that these domains do not operate in isolation from one another but are mutually influential (Ayoub & Fischer, 2006). Fragmentation of child development into entirely separate domains (e.g., social skills, cognition, biology) or skills (e.g., self-regulation, language, emotional understanding) overlooks the integrated nature of human development and the influence of developmental contexts (Fischer & Bidell, 2006; Lerner, Anderson, Balsano, Dowling, & Bobek, 2003; Overton, 2003). Accordingly, we discuss these domains within a dynamic skill theory framework (Fischer & Bidell, 2006), as previously articulated. Next, we consider how exposure to certain risk and protective factors shapes parenting and, in turn, affects young children's social and emotional wellbeing, by providing a brief review of major research findings in this area. Here, we highlight evidence that children who experience considerable adversity may develop along alternative pathways that appear pathological (and may, in fact, warrant intervention), yet reflect unique behavioral and psychological adaptations to extreme environments (Ayoub et al., 2006; Fischer & Ayoub, 1994). Because early childhood interventions can be important developmental change agents for young children and their parents living under high-risk conditions (e.g., poverty, exposure to violence, child maltreatment), we identify several examples of successful efforts to promote healthy parenting and socioemotional competence in young children to date. Finally, we focus on potential implications of empirical research on links between parenting and early childhood development for policies and programs aimed at enhancing social and emotional resilience in young children.

Emotion Regulation

One of the central means by which parenting exerts an influence on children's social and emotional skill development is by impacting children's ability to regulate their emotions (Calkins & Hill, 2007; Morris, Silk, Steinberg, Myers, & Robinson, 2007). *Emotion regulation* generally refers to the behaviors and strategies individuals use to monitor, evaluate, and influence the experience and expression of emotion (Calkins & Hill, 2007; Gross & Thompson, 2007; Thompson, 1994). It may be conscious or unconscious; it may require effort or occur automatically; it may impede or enhance emotional response (Calkins & Hill, 2007). The capacity to regulate one's emotional state is widely recognized as a core component of socioemotional competence and a central organizing principle of child development (Schore, 2001). In fact, adjustment from infancy to kindergarten can be charted largely on the basis of how well a child learns to regulate his or her emotional state with increasing independence from his or her parents (Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002).

Infants have an amazing capacity to mobilize their own resources to cope with stress (e.g., crying, moving, averting gaze, reaching, pointing), but neonates require fairly extensive scaffolding from attuned caregivers to manage dynamic shifts in internal states and autonomic arousal (Schore, 2010; Tronick, 2010). As parent–child dyads successfully manage everyday stressors in the first months of life, infants become increasingly capable of regulating emotions and coping with stress (Hane & Fox, 2006), but they continue to need regulatory support from primary caregivers to sustain stable emotional states (Beeghly, Fuentes, Liu, Delonis, & Tronick, 2011; Bernier, Carlson, & Whipple, 2010; Lindsey, Cremeens, Colwell, & Caldera, 2009). As children move into toddlerhood and the preschool years, they become less reliant on their caregivers for regulatory assistance as they become more proficient at self-initiating regulatory behaviors (e.g., seeking out another playmate after a frustrating interaction with a peer rather than throwing a tantrum). Preschoolers exhibit increasing flexibility, altering regulatory strategies to fit with the affective climate of their families and the emotional display rules of their culture (Fox & Caulkins, 2003; Morris et al., 2007). At the same time, the adults in their lives come to expect them to control their emotions in order to comply with societal and cultural expectations (Sroufe, Egeland, Carlson, & Collins, 2005). Children's self-regulatory capacities thus develop in a relational context throughout childhood and are highly

dependent upon early interactions with parents and other caregivers, even as children acquire more independence (Calkins & Hill, 2007; Stern, 1985).

Most children receive "good enough" parenting, or adequate physical and emotional attunement by an adult to allow them to advance emotional regulation skills toward an independent self, capable of mature relations with others (Winnicott, 1953). However, the progression is not linear; it is a dynamic transactional process in which temperament, maturational processes, and social environments influence development (Rosenblum, Dayton, & Muzik, 2009). Moreover, social, emotional, cognitive, biological, and neurodevelopmental mechanisms work in concert, enabling children to process social information, control their own levels of arousal, and plan responses to their environment with growing sophistication (Bell & Wolfe, 2004; Eisenberg, Hofer, & Vaughan, 2007). Stated from a dynamic skill theory perspective, self-regulation of emotions arises from progressively integrated skills along multiple strands of development that are shaped by children and their many life contexts (Ayoub et al., 2011; Fischer & Bidell, 2006).

Studies on the intersection of language and emotion regulation illustrate these "webs" of development. Language-rich environments (e.g., exposure to vocabulary, verbalizations, book reading) have been found to be positively associated with children's ability to talk about and understand their own feelings, to comprehend others' emotional experience, and to successfully manage interactions with peers—all skills related to successful emotion regulation (Kassow, Joachim, & Blasingame, 2010). For example, Ayoub and colleagues (2011) conducted a study on the development of self-regulatory skills and language skills in children at 14, 24, and 36 months and found that language skills (vocabulary) at 24 months predicted the growth of self-regulation at 36 months. In addition, the researchers determined that parent–child interaction mediated the impact of parenting stress on child self-regulation. Similar research has identified dynamic processes among domains of development that lead to emotion understanding in young children, another basic building block of socioemotional health in early childhood with strong links to parenting (Shipman & Zeman, 1999, 2001).

Emotion Understanding

Children are responsive to the emotional signals of others from a very young age. Even 2-month-olds can discriminate among a number of distinct facial expressions (Oster, 1981). Emotion understanding and experience

becomes more complex and differentiated throughout the first years of life. In particular, young children's emotional repertoire expands considerably in the first 5 years of life, from a rudimentary grasp of basic emotions (happy, sad, angry, scared, surprised, disgusted) in infancy to the experience of "self-conscious" emotions such as pride, shame, guilt, and embarrassment in the second year of life, which emerge as children gain awareness of others' evaluations of them (Lewis, 1993; Tangney & Fischer, 1995). Along with these advances, young children become increasingly aware of others' emotional and mental states, and they are able to enlist a wide repertoire of emotions during social interactions (for review, see Easterbrooks et al., 2012).

Emotion understanding refers to an individual's comprehension of the causes and consequences of emotions and the capacity to use that information to elicit appropriate responses to the affective experience of self and others (Parke, Cassidy, Burks, Carson, & Boyum, 1992). Emotion understanding facilitates intrapersonal and interpersonal regulation, thereby enhancing children's adaptation to their social environment (Campos, Campos, & Barrett, 1989). A substantial literature demonstrates that children who have more emotion knowledge exhibit more prosocial behavior, higher levels of empathy, increased social competence, and better psychological adjustment compared to their less knowledgeable peers (Cook, Greenberg, & Kusche, 1994; Denham, Renwick-DeBardi, & Hewes, 1994; Field & Walden, 1982; Rogosch, Cicchetti, & Aber, 1995; Schultz, Izard, Ackerman, & Youngstrom, 2001). For example, a study by Fabes, Eisenberg, Hanish, and Spinrad (2001) found that preschoolers who used a larger number of emotion words, made more references to the emotional states of others, and utilized emotionally laden language in social situations were better liked by their peers than children who did not exhibit these skills.

Young children come to understand emotions in large part through the beliefs, attitudes, and behaviors of their parents (Brophy-Herb et al., 2009; Gottman, Katz, Hooven, Eisenberg, & Cowan, 1996; Parke et al., 1992). In accordance with cultural beliefs and practices, adults scaffold their children's emotion knowledge by helping them to label and decode emotions, to understand and respond appropriately to the affective states of others, and to recognize emotions in the self (Saarni, 1990). These socialization processes support children in becoming proficient at appraising and processing emotional stimuli, a prerequisite of adaptive social development in childhood (Schultz et al., 2001). Although parents use a wide range of strategies to promote emotion understanding in children, research to date suggests

that particular practices are related to positive functioning in this sphere of development. For example, adults who engage their children in conversations about their feelings when in situations that evoke particular emotions tend to have children with higher levels of emotion understanding (Shipman & Zeman, 1999). In a study of preschoolers, Dunsmore and Karn (2001) found that children's emotion knowledge was highest when their mothers strongly valued and utilized emotion language. Similarly, Taumpopeau and Ruffman (2006) reported that mothers' use of desire words, such as "like," "love," "want," "wish," and "hope," with their 15-month-old offspring predicted their children's ability to use mental-state language and detect the emotional states of others at 24 months of age. Maternal explanations of the causes and consequences of emotions also have been found to be positively related to children's emotion understanding (Denham, Zoller, & Couchoud, 1994). As is true in other areas of socioemotional development, emotion understanding derives from intersystem links with other skill areas, including cognitive and perceptual development (Ackerman, Abe, & Izard, 1998). To illustrate these transactions, Schultz and colleagues (2001) offer the example of a toddler who sees her father avoid contact with fire on several occasions and thus learns to associate fire with fear. Thus, intentionally or unintentionally, in discrete and interrelated areas of development, parenting has considerable impact on emotion learning in children.

Attachment

A large body of research suggests that parent–child bonds have primary bearing on an individual's life course in general, and on social and emotional development in particular (e.g., Barnard & Solchany, 2002; Bell & Ainsworth, 1972; Bowlby, 1958; Winnicott, 1965). The development of relationships between infants and their caregivers promotes children's survival and serves as the principal organizing force for their social and emotional development. Through these and other dyadic transactions, children form their most basic mental representations of how relationships work, or, to use Bowlby's (1977) term, *internal working models* that serve as the basis for all subsequent relationships. Secure attachment relationships also have a salutogenic effect on neurodevelopment, strengthening the stress response systems of the brain (Gunnar, 2000). Accordingly, many early childhood experts view attachment as one of the most critical early indices of socioemotional growth (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969).

According to attachment theory, mutual regulation between infants and their caregivers consolidates between 6 and 12 months of age, as infants become more aware of caregivers' psychological qualities, come to expect certain behaviors from them, and acquire basic trust that their needs will be met (Ainsworth et al., 1978). Healthy attachment relationships depend, in large part, on an adult who can respond sensitively to the infant's needs and signals and, in doing so, the adult addresses two fundamental needs: (a) easing the child's distress and helping the child to manage difficult emotions in challenging circumstances, and (b) instilling in the child a sense of competence and self-efficacy. Hallmarks of a "secure" attachment include a child's confident exploration of the world while maintaining reassuring connection with a caregiver (e.g., a toddler who wanders off to play and glances back at a parent in search of a comforting look, or returns to the adult occasionally for physical contact), and effective soothing by a parent when the child is distraught (Ainsworth et al., 1978; Cassidy & Shaver, 2008).

In some instances, young children develop insecure attachments with the adults who care for them, reflecting distrust in the sensitivity, responsiveness, and predictability of their primary caregivers. Insecurely attached children may be difficult to soothe, express considerable anger, sadness, or fear, or exhibit flat affect in their attachment figure's presence, or show anxious dependency, avoidance of affect sharing, or ambivalence (Ainsworth et al., 1978; Thompson, 1998). Insecure attachments increase a child's risk of poor social and emotional functioning, but development of psychological disorder is by no means inevitable (DeKlyen & Greenberg, 2008). In comparison, disorganized attachment relationships, characterized by a child's complete lack of a coherent strategy for acquiring caregiver support in stressful circumstances, is highly associated with subsequent psychopathology (Lyons-Ruth & Jacobvitz, 2008). Given that disorganized attachments tend to occur in the context of extreme negative conditions (e.g., severe maltreatment or trauma), it is not surprising that a child's chances of developing significant psychosocial problems are heightened (DeKlyen & Greenberg, 2008; Dozier, Stovall-McClough, & Albus, 2008; Lyons-Ruth & Jacobvitz, 2008; MacDonald et al., 2008; Sroufe, 1997).

Pronounced dysfunction in parent–child relationships (e.g., abuse and neglect) may comprise a form of "toxic stress" that compromises the infant's ability to respond to stress (National Scientific Council on the Developing Child, 2005). However, exquisitely attuned parenting and dyadic

synchrony at every turn is not necessary for socioemotional growth (Tronick & Beeghly, 2011). In fact, dyadic mismatches that occur in the context of warm, safe, and secure relationships are part of the normative developmental process and may be the type of "positive stress" that allows children to develop a sense of mastery, self-efficacy, and basic trust (National Scientific Council on the Developing Child, 2005), especially when mismatches are repaired quickly (Tronick & Beeghly, 2011).

Attachment relationships and parental sensitivity are influenced by many facets of parents' life experiences, including childhood history of attachment relationships, health, psychosocial wellbeing, exposure to life stressors, quality of relationships with others, social support, and cultural beliefs and values (for review, see Fonagy, Steele, & Steele, 1991; Weinfield, Sroufe, Egeland, & Carlson, 2008). Thus, each attachment relationship is embedded in a unique sociocultural context (Beeghly et al., 2011) shaped by complex interactions among multiple risk and protective factors (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006).

Risk and Protective Factors: Strengths and Challenges in Building Positive Relationships

Insight into any single vulnerability or protective factor is less predictive of long-term individual adjustment than a comprehensive understanding of how multiple risk and protective processes operate in children's lives (Garmezy, Masten, & Tellegen, 1984; Sameroff & Fiese, 2000). Furthermore, there is a growing awareness that certain characteristics may be protective or risk-inducing in some contexts but operate quite differently in others (Wyman, 2003; Wyman, Cowen, Work, & Kerley, 1993). Such advances hold promise for capitalizing on interventions that can be implemented in this sensitive period, using targeted approaches delivered early to children and their families (i.e., prenatally and in the first years of life) to support resilience (Olds et al., 2004; Toth, Rogosch, Manly, & Cicchetti, 2006).

Over four decades of research suggests that young children have a remarkable capacity for *resilience*, or positive adaptation despite adversity, equipped only with ordinary developmental capabilities and resources (Masten, 2001). Nevertheless, the assumption that children readily "bounce back" in response to severe stress and trauma conflicts with a substantial body of evidence

demonstrating that adverse early experiences can have negative and long-lasting consequences for children's social and emotional wellbeing (Chu & Lieberman, 2010; National Scientific Council on the Developing Child, 2010). Because some children appear to be more resistant to the effects of stress and trauma while others exhibit psychopathology, a question of great interest to early childhood policy makers, practitioners, and researchers alike is: What factors lead to divergent life trajectories in the face of significant threats to development (Lerner, 2006)?

Early childhood is a time of great opportunity for both resilience and vulnerability because systems are emergent and not fixed (Easterbrooks, Driscoll, & Bartlett, 2008). Because young children develop within multiple interrelated contexts (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006), it is unlikely that any single factor wholly potentiates or undermines social and emotional resilience. Exchanges between a child and his or her environment, whether proximal (e.g., parent–child relations), intermediate (e.g., school), or distal (e.g., socioeconomic status), all are implicated in ontogenetic change processes leading to diverse developmental trajectories (Cicchetti & Valentino, 2006; Werner & Smith, 1982, 1993). Accordingly, a holistic view of social and emotional wellbeing considers the interplay among a myriad of risk and protective factors that impede development or buffer against adversity and support resilience.

Risk factors generally refer to characteristics of individuals and their environments that increase the odds of poor outcomes (Masten & Garmezy, 1985). Risk factors often accumulate in children's lives, thereby increasing the likelihood of negative developmental trajectories (Sameroff & Seifer, 1995). For example, compared to children living in lower risk families, children living in families who concurrently experience multiple sociodemographic risk factors (e.g., poverty, single parenthood, low parental education, multiple siblings) are more likely to exhibit significant social, emotional, and behavioral problems (Moore, 2006). Neurobiological evidence suggests that exposure to exceptionally difficult circumstances elicits chronic stress, anxiety, and fear, which interfere with healthy brain development and, in turn, disrupt children's behavior, ability to relate to others, and capacity to learn. For example, severe abuse and chronic neglect has been found to trigger alterations in the immature brain, leading to profound deficits in social and emotional functioning (Glaser, 2000; National Scientific Council on the Developing Child, 2010). In contrast, *protective factors* (e.g., positive parent–child relationships, social connections, financial stability,

neighborhood resources) increase the odds that children demonstrate positive adaptation in the presence of adversity (Masten & Garmezy, 1985). Some buffer against particular adversities, others support growth more universally, and cumulative protection (i.e., multiple protective factors) can counteract the negative effects of cumulative risk (Masten, 2006).

Child Characteristics

Children are born into a complex social environment of relationships that influence their life trajectories, but each child and parent influence one another's emotional state in an ongoing dynamic way (Sameroff, 1993). As such, characteristics that children themselves bring to these interactions may be sources of risk and protection. For example, early-emerging traits, such as elements of temperament (e.g., activity level, reactivity, emotionality, soothability) contribute to a child's experience of the world as well as reactions to it (Rothbart & Bates, 2006). Irritability, persistent negative affect, difficulty settling into routines, extreme inhibition, and fearfulness in infancy have been found to be temperamental precursors of internalizing and externalizing problems in childhood (Rothbart, Posner, & Hershey, 1995). Individual biomedical problems are also associated with poor socioemotional adjustment. For example, prematurity has been found to increase vulnerability to stress and has the twofold consequence of placing the infant's life in danger while provoking intense emotional reactions from parents that may strain the parent–infant relationship (Forcada-Guex, Borghini, Pierrehumbert, Ansermet, & Muller-Nix, 2011; Mrazek & Haggerty, 1994).

In contrast, temperamental qualities exhibited by "easy" babies, such as being easy to soothe, socially responsive, good-natured, and affectionate, may buffer them from negative effects of misfortune (Cowen, Wyman, Work, & Parker, 1990; Moffit & Caspi, 2001). During toddlerhood and preschool, self-confidence and strong social and communication skills predict resilient functioning (Farber & Egeland, 1987; Werner & Smith, 1982, 1993). In addition, girls appear to have a slight biological "edge" over boys in that they have lower rates of psychopathology (e.g., autism, conduct disorder), neurological problems, birth defects, and mortality (Rutter, 1989). Of course, the impact of such biologically based risk factors depends on other interceding risk and protective factors, including parenting (Mrazek & Haggerty, 1994; Werner & Smith, 1982).

Parent and Family Characteristics

As discussed earlier, parenting sets the stage for children's socioemotional development. Nurturing relationships, competent parenting, and close bonds (secure attachments) with parents predict better long-term outcomes for children (Farber & Egeland, 1987; Werner & Smith, 1982, 1993), and specific parenting characteristics that foster these relations are critical to resilient child functioning in conditions of risk (Luthar, 2006). The presence of a sensitive, responsive, and caring adult early in childhood is the most widely cited protective factor in extensive scientific literature on risk and resilience (Masten, 2001; Riley & Masten, 2005; Werner, 2000). Conversely, environments of extreme deprivation (e.g., institutional care) or chronic maltreatment place children in jeopardy of developing serious disturbances of attachment, as well as psychiatric disorders (Smyke, Dumitrescu, & Zeanah, 2002; Zeanah & Smyke, 2008). Family violence and parental psychopathology also constitute significant threats to young children's well-being, placing them at risk for multiple adverse outcomes in childhood and adolescence (e.g., conduct problems, anxiety, depression, low self-esteem, difficulty with peers) (for review, see Margolin & Gordis, 2000). Adolescent parenting also has been found to place infants at risk for poor socioemotional functioning (e.g., behavior problems, insecure attachments) (Coley & Chase-Lansdale, 1998; Easterbrooks, Chaudhuri, Bartlett, & Copeman, 2011; Furstenberg & Brooks-Gunn, 1986).

Environmental Characteristics

Resilience emerges from community and societal contexts in addition to individual and family attributes, and contemporary models of resilience consider patterns of adaptation from this vantage point (Riley & Masten, 2005). Studies on poverty and early childhood have repeatedly documented social, emotional, and behavior problems in indigent children, as well as poor school performance and physical health (for review, see Owens & Shaw, 2003). Research on the socioemotional correlates of poverty among infants and toddlers is particularly disturbing, suggesting elevated risk for poor social and emotional outcomes during this formative stage of development (Brooks-Gunn, Duncan, & Aber, 1997; Evans & English, 2002; Morris & Gennetian, 2003). Young children exposed to community violence also are at

risk for a range of psychological and behavioral problems, including insecure attachments to caregivers, depression, anxiety, and aggressive behavior (Garbarino, Dubrow, Kostelny, & Pardo, 1992; Gorman-Smith & Tolan, 2003; Lynch & Cicchetti, 1998).

By contrast, positive community contexts promote resilience among infants and their families. External support systems, such as early care and education settings, neighborhoods, parents' workplaces, and health/mental health-care facilities, especially when they function collectively, can be highly effective in promoting child and family wellbeing (Center on the Developing Child at Harvard University, 2010). In particular, studies have identified the protective effects of participation in good-quality child care, access to reliable social support, and neighborhood cohesion, especially for young children from impoverished families (Center on the Developing Child at Harvard University, 2010). Early intervention can enhance socioemotional competence in young children by supporting caregivers, ensuring a family's access to basic needs and services, and increasing the skills and awareness of nonfamilial caregivers regarding socioemotional problems in early childhood (Zeanah & Zeanah, 2009). With the understanding that early environments are powerful shapers of individual development, and that such environments extend beyond the immediate family, some intervention approaches also facilitate families' access to social support and concrete resources in the community. Indeed, intervention programs have shown some of the most profound effects when they consider the influence of early childrearing contexts on development over the life course (Lester & Sparrow, 2010; Shonkoff & Phillips, 2000). And yet, until the recent paradigm shift toward ecological perspectives, this critical element was largely absent from the discourse on early childhood initiatives.

Early Intervention as a Developmental Change Agent

While research has clearly established the parenting context as the most salient for young children's development (Bornstein, 2006), other immediate contexts, such as early childhood intervention programs (e.g., early care and education, Early Head Start/Head Start, home visiting), can have profound effects on children's social and emotional development. When these programs are of high quality, they may serve as a powerful developmental change agent to support early socioemotional health both through direct work with children and through efforts to promote healthy parenting

and support family wellbeing. Relationship-based models that involve a partnership between parents and providers, who work in concert to support children's development, are some of the most successful (Jacobs, Swartz, Bartlett, & Easterbrooks, 2010).

Early Care and Education

Young children are spending an increasing amount of time in out-of-home early care and education environments. Over 60% of young children (ages 0–5) in the United States today are in out-of-home care, and children of employed mothers spend an average of 32 hours per week in such settings (U.S. Department of Education, 2011). There is a robust body of research focused on the effects of child care on children and families. One aspect of early care and education that has been found to be particularly influential in children's development is quality of care; quality of care plays a central role for children who face challenging circumstances in their homes and their communities (Burchinal et al., 2000; Burchinal, Roberts, Nabors, & Bryant, 1996; Davis & Thornburg, 1994; Kontos, 1991; NICHD Early Child Care Research Network (ECCRN), 1998; Peisner-Feinberg & Burchinal, 1997; Shonkoff & Phillips, 2000; Vandell & Wolfe, 2000; Zaslow, 1991), especially among children at risk for developmental delays (NICHD ECCRN, 1998; Peisner-Feinberg et al., 2001; Vandell & Wolfe, 2000).

Researchers have examined both structural and process-related aspects of quality care. Structural quality includes characteristics related to the child-care setting, including teacher and director education and training, child–adult ratios, materials and equipment, group size, and program size (McKim, 1993; Vandell & Wolfe, 2000). Many of these structural characteristics have been associated with high global quality (Barnett, 2003; Bowman, Donovan, & Burns, 2000; Burchinal, Cryer, Clifford, & Howes, 2002; Ghazvini & Mullis, 2002; NICHD ECCRN, 2002; Whitebook, 2003), as well as positive outcomes for children's wellbeing and experiences in child care (Burchinal et al., 1996; Ghazvini & Mullis, 2002; Howes, 1997; Loeb, Fuller, Kagan, & Carrol, 2004; Whitebook, Howes, & Phillips, 1990).

While structural quality focuses on the static features of the child-care environment, process quality includes measures of children's actual experiences in child care including children's interactions with caregivers and peers, involvement and participation in activities with developmentally and age-appropriate materials, and health and safety practices (Burchinal et al.,

1996; Davis & Thornburg, 1994). Process-quality variables, especially the quality of teacher–child relationships and sensitivity of teacher–child interactions, have positive effects on children's social development and experiences in child care (Howes, 1999; McCartney et al., 1997; Peisner-Feinberg & Burchinal, 1997; Zaslow, 1991). Children who have secure relationships and positive interactions with their caregivers appear to be more prosocial and constructively engaged with classmates than those who do not. In fact, some research has shown that positive relationships between children and their child-care providers can serve a compensatory function when parent–child relationships have been disrupted by supporting young children's social and emotional competence (Holloway & Reichart-Erickson, 1990; Howes, Hamilton, & Matheson, 1994; Kontos & Wilcox-Herzog, 1997; Vandell & Wolfe, 2000). Positive relationships between early childhood teachers and children also have been linked to improved cognitive development and school success (Birch & Ladd, 1997; Hamre & Pianta, 2001; Pianta, 1999; Pianta & Stuhlman, 2004).

While the empirical literature on parent–provider relationships in early care and education settings is less robust than literature on relationships between children and child-care providers, relationship quality is linked to both family and child outcomes. Specifically, positive parent–provider relationships are associated with parents' satisfaction with services (Kontos & Dunn, 1989), parent involvement (Elicker, Noppe, Noppe, & Fortner-Wood, 1997; Endsley, Minish, & Zhou, 1993; Nzinga-Johnson, Baker, & Aupperlee, 2009), parental self-efficacy beliefs (Green, McAllister, & Tarte, 2004; Trivette, Dunst, & Hamby, 2010), and the quality of parent–child relationships (Dunst, 2002; Heinicke et al., 2000). In turn, positive relationships between parents and child-care providers are associated with children's emotional wellbeing (Roggman, Boyce, & Cook, 2009; Sheridan, Knoche, Edwards, Bovaird, & Kupzyk, 2010; van IJzendoorn, Tavecchio, Stams, Verhoeven, & Reiling, 1998), social skills (Churchill, 2003; McWayne, Hampton, Fantuzzo, Cohen, & Sekino, 2004; Mendez, 2010; Serpell & Mashburn, 2011; Smith & Hubbard, 1988), behavior (Graves & Shelton, 2007; Lee et al., 2009; Serpell & Mashburn, 2011; Webster-Stratton, Reid, & Hammond, 2001), and academic skills (Arnold, Zeljo, Doctoroff, & Ortiz, 2008; Fagan & Iglesias, 1999; McWayne et al., 2004; Roggman et al., 2009). Furthermore, positive parent–provider relationships are associated with more provider involvement with children (Smith & Hubbard, 1988; Ware, Domingue, & Owen, 1997) and more sensitive and supportive

caregiver–child interactions (Hogan, Ispa, & Thornburg, 1991; Owen, Ware, & Barfoot, 2000; Serpell & Mashburn, 2011).

Two-Generation Interventions

Two-generation interventions such as Early Head Start and Head Start are in the unique position of having important impacts on both young children and their parents, as well as influencing parent–child relationships and interactions. Rigorous, large-scale, random-assignment evaluation research suggests that these programs may be especially effective in buffering young children and their families in the context of risk (Ayoub et al., 2011; Love et al., 2002; U.S. Department of Health and Human Services [USDHHS], 2005, 2010). For example, an evaluation of Early Head Start (EHS), a federally funded program for low-income pregnant and parenting women with infants and toddlers, found favorable impacts on the social and emotional development of children by age 3. These included lower levels of aggression, higher levels of sustained attention during play, and fewer negative interactions with their parents compared to children who were not enrolled in EHS. The intervention also demonstrated positive effects on parenting, such as increased warmth and supportiveness, more time playing with children, greater likelihood of reading to children, and less likelihood of spanking in comparison to control-group parents (Love et al., 2002).

The extent of Head Start's positive impact on children's psychosocial competence has been more controversial. Significant effects of the program were consistently positive for 3- and 4-year-olds and their families (less hyperactivity or withdrawal, fewer behavior problems, and favorable social skills in children; better parenting, including reading to children, less spanking, closer relationships with children), but these improvements largely disappeared by the time children reached first grade. It is not clear whether methodological issues (e.g., demographic differences between the control and intervention group), intervention length (the study only represented 6 to 9 months of the intervention), poor-quality elementary education, or other factors explain the lack of significant findings at first grade follow-up (USDHHS, 2005, 2010). Interestingly, children with special needs showed improvements in socioemotional functioning by the end of first grade, suggesting that certain at-risk populations may benefit more than others from two-generation interventions. Regardless, Head Start appears to have social and emotional benefits for both children and their parents, at least in the short term.

Positive effects of two-generational programs on social and emotional wellbeing in early childhood parenting may be direct—by working with children in center-based care or at home, or indirect—by enhancing parenting skills and knowledge, or by improving a family's access to social and financial resources. A longitudinal investigation of EHS families by Ayoub and colleagues (2011), for instance, found that children enrolled in EHS had somewhat better self-regulatory skills than children in the comparison group. However, the impact of the program was even more profound in relation to parenting. The investigators determined that participation in EHS protected parenting by ameliorating the negative impact of parenting stress and insensitivity on young children's self-regulatory skills and concurrent language development. Specifically, they found that EHS strengthened parents' intentional teaching of children during everyday interactions, bolstered parents' cognitive stimulation of children, and protected child language from parenting insensitivity.

It is important to remember that no early intervention programming can fully protect young children against the cumulative family effects of extreme poverty, lack of high-school educational skills, and chronic unemployment. These risk factors, when they present as a cluster, create almost insurmountable odds for young children's age-appropriate positive growth across domains. The EHS evaluation study demonstrates the power of these demographic indicators on socioemotional, cognitive and language development (Ayoub et al., 2011), These findings further emphasize the need for two-generational programming. In addition, they strongly suggest the importance of improved and extended community-based programs that target financial stability and improved educational opportunities for parents of young children living in poverty. Finally, collaborative community-level systems of care for families of our youngest children are imperative if these children are to have a truly good start in support of school readiness and continued achievement.

Implications for Promoting Social and Emotional Health in Early Childhood

Early care and education and two-generational programs are only a few of numerous approaches to supporting young children's socioemotional wellbeing through early intervention. Programs vary on a number of dimensions, including structural features (e.g., mode of delivery, timing, duration,

frequency, degree of integration with other services), program goals and content (e.g., focus on child development, focus on parental practices that lead to positive child outcomes), and strategy employed (e.g., relationship building, offering parents information about child development and healthy parenting practices, linking families to resources in the community) (Powell, 2005). The broad array of efforts that exist today are a positive sign of a growing consensus that fostering early social and emotional development ought not to be the province of the mental health profession alone (Bartlett, Waddoups, & Zimmerman, 2007). Given the diversity and sheer number of programs working with families and young children, it is of the utmost importance to determine which are most effective and why; that is, based on evidence of positive child outcomes. Nearly all early childhood interventions are oriented toward a family focus, and many contemporary approaches target parenting behavior, with the rationale that positive changes in parenting directly benefit children (Brooks-Gunn, Berlin, & Fuligni, 2000). But even very well-intentioned (and well-funded) efforts to steer families in positive directions in the name of supporting young children may be relatively ineffective. Disappointing findings from large-scale evaluations of home-visiting programs to prevent child maltreatment offer one notable example, although a few promising practices have emerged (Howard & Brooks-Gunn, 2009). Evidence to date suggests that most successful initiatives are relationship-based, meaning that they acknowledge the centrality of relationships and the dynamic social and relational contexts in which children live and grow (Berlin, 2005; Lester & Sparrow, 2010; Sameroff, McDonough, & Rosenblum, 2004). Accordingly, significant investments in provider training and professional development are needed to cultivate an early childhood workforce that is cognizant of the importance of early relationships and skilled in intervening with families experiencing relationship disruptions (Jacobs et al., 2010; Shonkoff & Phillips, 2000). Research also suggests that effective programs: (a) address multiple areas of a family's life, (b) focus on developing the parenting skills necessary to avoid problem behaviors and engage in positive parent–child relationships, (c) are based on a solid theory of change, (d) offer sufficient dosage to produce the intended effect, (e) demonstrate fidelity to a model yet tailor the content to be culturally relevant to particular groups of families, and (f) are implemented as early in life as possible, ideally during the pre- or postnatal period (Nation et al., 2003; Shonkoff & Phillips, 2000). Moreover, even programs that target specific areas of child growth are more efficacious when they address multiple areas of child development and the intersections among them (Ayoub

& Fischer, 2006; Fischer & Bidell, 2006). Indeed, the National Scientific Council on the Developing Child (2004, p. 4) encouraged all programs to "balance their focus on cognition and literacy skills with significant attention to emotional and social development."

Promoting social and emotional competence in young children, and thus preparing them to be successful in school and later on in life, will require more than a few good programs. Additional research is needed to strengthen the scientific basis for prevention, as are innovative policies and practices that translate what we learn to what we do "on the ground" with young children and families from diverse backgrounds. Perhaps above all, we will need a national commitment to establishing a comprehensive, integrated system of care that provides *all* children with the nurturing and growth-promoting experiences they need to become well-adjusted members of society. With one in five children living in poverty, over 750,000 children experiencing abuse or neglect, 70% of mothers with young children (under 5) in the workforce, and only 14% of 3-year-olds and 39% of 4-year-olds in state-funded prekindergarten programs, Head Start, or special education programs (Children's Defense Fund, 2011), the time to invest in children is now.

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Part 3
School and Child Care
Settings that Impact Child and Family Wellbeing

11

High-Risk Home and Child-Care Environments and Children's Social-Emotional Outcomes

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In this chapter we will focus on the specific home and child-care characteristics with the most empirical support suggesting that they are risk factors for poor social-emotional outcomes. Given that this volume addresses many aspects important for child wellbeing, we have also selected topics with an eye toward emphasizing those not covered extensively elsewhere in this volume. As we have been asked to integrate work on home and child-care environments, the fact that characteristics of these two environments are inexorably linked comes immediately to mind. It is clear that a family's educational and financial resources impact the type and quality of child care they are able to select for their children (Torquati, Raikes, Huddleston-Casas, Bovaird, & Harris, 2011). Unfortunately, much less is known about how characteristics of families and characteristics of their child-care environments interact to impact child outcomes. Wherever possible, we highlight such work, and throughout we utilize a bioecological systems perspective (Bronfenbrenner & Ceci, 1994) to highlight the hypothesized interplay

of contextual influences on the child. Specifically, we focus on the high-risk home characteristics of maternal depression, child maltreatment, and insecure parent–child attachment, and the high-risk child-care characteristics of low quality, placement instability, and teacher–child relationship difficulties. Note that, because we focus on social-emotional outcomes, we do not include risk factors such as nutrition, cognitive stimulation, or substance use that have well-known associations with academic and physical health outcomes. In line with a bioecological systems perspective, we also briefly review the literature documenting that high-risk home and child-care environments are disproportionally experienced by children living in poverty, and that the constellation of risk that often co-occurs with living in poverty has well-known impacts on children's socioemotional outcomes.

Home and Child-Care Environments as Bioecological Systems

Decades of research have illustrated the important contributions of the home and child-care environments to many aspects of children's development, emphasizing the importance of these two critical early microsystems (e.g., Belsky, 2001; Maccoby, 1992; NICHD ECCRN, 2004, 2005). From this perspective, in order for us to understand how to promote healthy development in children, we must also focus on the mesosystem, or the interconnectedness and joint developmental influences of the two microsystems of home and child-care contexts (Phillips, McCartney, & Sussman, 2006). A bioecological systems perspective also recognizes that the impact of these systems cannot be understood without consideration of the biopsychological characteristics of the child, including factors such as genetics, physiological stress reactivity and temperament (not reviewed here), the broader macrosystem effects including poverty, or the chronosystems' unfolding effects across the life span. Further, the mesosystem is inherently transactional, suggesting that the combined effects of these interacting systems across time on developmental trajectories of risk and resilience may be potentially much more influential than a simple additive model would suggest (Garmezy, 1994). Specifically, in regard to home and child-care environments in the first few years of life, it has been argued that experiencing risk at home, at child care, in neither environment, or in both environments together, creates differential developmental niches with potentially vastly different outcomes,

known respectively as the lost-resources, compensatory, double-protection, and double-jeopardy niches (Phillips, 2006).

High-Risk Home Environments

Risk is defined as the presence of one or more factors or influences that increase the probability of a negative developmental outcome. Risk factors can be either enduring or transient, and are often characterized as either individual characteristics or aspects of the environment. High-risk home environments are strongly predictive of how children behave, how they perform in school, how well they get along with others, and how likely they are to develop psychological disorders (Ayoub, Vallotton, & Mastergeorge, 2011; Coie & Dodge, 1998; Guralnick, 2006; Hastings, McShane, Parker, & Ladha, 2007). The quality of the home environment is generally approached as a mix of both the quality of the parent–child interactions (e.g., parental warmth and responsiveness, discipline practices, maltreatment), observed structural characteristics of the home (e.g., number of books in the home, availability of appropriate play materials, routine opportunities for interaction), and demographics characteristics of the family (e.g., parental education) (Bornstein & Tamis-Lemonda, 1989; Bradley, 2002; Duncan & Brooks-Gunn, 1997; NICHD ECCRN & Duncan, 2003; Totsika & Sylva, 2004).

The quality of the interactions in the home environment has long been recognized as important for young children's development, and these proximal processes have direct influences in shaping the child's social and emotional development (Bronfenbrenner, 1999). Interactions with caregivers may be particularly important early in development when the child is highly dependent on adults not only for physical care, but also as buffers against physiologic stress (Gunnar, Brodersen, Nachmias, Buss, & Rigatuso, 1996), as co-regulators of negative and positive emotions (Thompson & Lagattuta, 2006), and as a secure base for exploration of the environment (Carlson & Sroufe, 1995). Depending on the quality of their interactions, children with sensitive and effective caregivers are expected to develop regulatory capacities that allow them to modulate stress reactions more effectively and be more equipped to manage their emotional arousal within social interactions, thus leading to better social relationships (Parker & Gottman, 1989).

Within early parent–child relationships, children are also provided with direct modeling of foundational psychosocial skills that are predictive of

future competencies. Specifically, parents are constructing an emotional climate wherein children learn about expectations for behavior and the skills necessary for relationships. These include reinforcement contingencies, conflict resolution skills, shared positivity and mutuality, and role and emotion exploration during pretend play. Parents who are able to modify their own reactions to fit with their child's developmental stage and their child's individual characteristics (e.g., temperament) are thought to be providing an optimal environment for psychosocial development, and are expected to be more effective in scaffolding their child's development (Guralnick, 2006). Indeed, current perspectives on risk, resilience, and developmental psychopathology recognize the significance of early close relationships in predicting psychological wellbeing (Cicchetti, Toth, & Lynch, 1995; Roisman & Fraley, 2012).

Childhood Maltreatment and Neglect

Work on intergenerational transmission of risk points to the importance of considering risk as an ongoing, transactional process. One area where this has been repeatedly demonstrated is the work examining maltreatment and neglect. Childhood maltreatment can involve physical abuse, like being burnt, beaten, or sexually molested. It can also include psychological abuse, such as rejection or ridicule, or neglect or deprivation of the physical and emotional stimulation that is considered crucial for normal development to proceed (Cicchetti & Toth, 2006a). Childhood maltreatment is a form of aberrant caregiving that poses substantial risk for adversely affecting psychological development across a broad range of domains, and it can have profound and wide-ranging effects on later psychosocial functioning (Cicchetti & Toth, 2005).

Maltreatment has multiple causes, and risk factors for maltreatment include characteristics of both the specific child and the family, as well as other aspects of the environment (Cicchetti & Carlson, 1989). No single characteristic of the child or of the home can account for the complexity of its occurrence. Recognizing this complexity, one useful framework for understanding maltreatment is a developmental psychopathology approach. This organizing approach to maltreatment integrates multiple disciplines and perspectives (Manly, Kim, Rogosch, & Cicchetti, 2001), and emphasizes the interplay among the characteristics of the child, the family, and the environment as risk and protective factors that change over time (Cicchetti & Rizley, 1981). Over the course of their development, children will demonstrate

different capabilities for managing particular experiences; therefore the age of onset of maltreatment is likely to play a role in how future developmental functioning is affected (Cicchetti & Lynch, 1995; Manly et al., 2001).

Children who are maltreated earlier in life may be at greater risk for the development of negative psychosocial functioning. For example, in their large sample of maltreated preschoolers and children, Manly et al. (2001) demonstrated that, although maltreatment occurring at any point during childhood was predictive of negative outcomes, differential patterns emerged based on the timing of these adverse experiences. Physical neglect during infancy or toddlerhood and sexual abuse during the preschool period predicted externalizing behavior and aggression, while physical neglect during the preschool period was associated with internalizing symptoms and withdrawn behavior. Additionally, chronic maltreatment early in development was linked to more maladaptive outcomes (Manly et al., 2001), suggesting that early maltreatment serves as an extreme risk for successful development over time.

The occurrence of maltreatment early in development constitutes a violation of expectation for a particular developmental environment (Cicchetti & Lynch, 1995). An essential role of the parent is to recognize and adapt to the changing needs of the child, and a failure to do so (like that which occurs in the case of neglect) will create an incongruent environment for the developing child. In the case of physical or sexual abuse, the child may become fearful of the parent, the very person that the child must rely on. Thus, maltreatment during this time reflects a dramatic deviation from what is considered a minimum standard for optimal development (Cicchetti & Toth, 2006b).

Although many factors contribute to a home environment where maltreatment or neglect is occurring, one common factor appears to be stress. Children living in a home environment that is high in marital conflict (Belsky, 1993) and substance abuse (Brown, Cohen, Johnson, & Salzinger, 1998), or low in financial stability and high in economic distress (Drake & Pandey, 1996) are more likely to experience abuse or neglect. Importantly, these stressors are often encountered in the absence of important social support systems (Coohey, 1996). In addition to stress, low parental efficacy also contributes to maltreatment, and parents who endorse punitive punishment techniques are more likely to mistreat their children (Woodward & Fergusson, 2002). Parents who maltreat are more likely to suffer from psychopathology, like depression, or some other affective disturbance (Kotch, Browne, Dufort, Winsor, & Catellier, 1999) and maltreatment can recur intergenerationally. That is, individuals who were maltreated themselves at

some point during their development are more likely to engage in similar behaviors with their own children (Berlin, Appleyard, & Dodge, 2011; van IJzendoorn, 1992), although, of course, this is far from a certain outcome. Finally, particular characteristics of the child are also likely to put them at an increased risk for experiencing maltreatment. These include a negative temperament (Baumrind, 1995), inattention or hyperactivity (Ouyang, Fang, Mercy, Perou, & Grosse, 2008), or other developmental problems (Brown et al., 1998). Unfortunately, negative behavioral cycles between parents and children can increase the likelihood of maltreatment over time (Belsky, 1980; Repetti, Taylor, & Seeman, 2002).

Maltreated children are at increased risk for a wide range of psychosocial problems. For example, because early emotional and affective regulatory processes develop within the co-regulatory context of the parent–child relationship, disruptions in affect regulation are more common among maltreated children when compared to nonmaltreated children (Cicchetti & Toth, 2006b; Kim & Cicchetti, 2010). Maltreated children are also at increased risk for developing internalizing and externalizing disorders (Oshri, Rogosch, Burnette, & Cicchetti, 2011; Toth, Manly, & Cicchetti, 1992), and impaired social functioning including increased aggression (Alink, Cicchetti, Kim, & Rogosch, 2012; Kim & Cicchetti, 2003; Teisl, Rogosch, Oshri, & Cicchetti, 2011). Maltreated children have also been found to experience peer rejection (Bolger & Patterson, 2001), to have persistently low self-esteem (Bolger, Patterson, & Kupersmidt, 1998), and to engage in less competent play behavior (Valentino, Cicchetti, Toth, & Rogosch, 2011). The quality of the attachment relationship is also likely to suffer within this toxic family environment.

Maternal Depression

Untreated maternal depression has also been widely recognized as a risk factor for negative socioemotional outcomes in youth. For example, prevalence rates of psychiatric disorders among children of depressed parents have been estimated to be two to five times higher than in youth without depressed parents (Beardslee, Versage, & Gladstone, 1998), and the risk for substance use dependency is approximately three times higher (Weissman et al., 2006). Several possible explanations exist for the pervasive impacts of maternal depression on children, with Goodman's and Gotlib's (1999) Integrative Model for the Transmission of Risk serving as a useful organizing framework. Included within this model are the influence of shared genetics

(Rice, Harold, & Thapar, 2002), fetal exposure to stress hormones or toxins (Essex, Klein, Cho, & Kalin, 2002), psychological vulnerabilities (Connell & Goodman, 2002), insensitive parenting behaviors (Lovejoy, Graczyk, O'Hare, & Neuman, 2000), and increased contextual risk factors like more stressful life events (Goodman & Gotlib, 1999; Hammen, 1991).

A major depressive episode as defined by the Diagnostic Statistical Manual-IV (2000) includes a total of five symptoms for at least 2 weeks, and symptoms must include a depressed mood and/or loss of interest or pleasure in activities. Other symptoms include loss of energy, feelings of worthlessness or guilt, trouble concentrating, sleep disturbances, and feelings of hopelessness or helplessness. Depressed mothers have been described in the clinical literature as experiencing difficulties with parenting that are reflective of the specific symptoms of the disorder (Burbach & Borduin, 1986), and the timing and duration of the depressive episode is important for predicting its impact (Alpern & Lyons-Ruth, 1993). As in the case of maltreatment, inadequate parenting when children are reliant on their caregiver for resolving certain stage-salient social-emotional tasks creates a particularly sensitive period for the effects of maternal depression (Cicchetti & Toth, 1998).

Under the cloud of depressive symptoms and psychological distress, depressed mothers are likely to demonstrate a range of interpersonal deficits that serve as a model of maladaptive social and emotional functioning (Hammen, 2002). These differential learning processes and reinforcement contingencies may place children at risk through the acquisition of different cognitions, behaviors, and affect (Goodman, 2007). Compared to non-depressed mothers, depressed mothers may be more inconsistent and less responsive with their children (Field, 1995). Included in these parenting behaviors are less warmth, less synchrony, and less sensitivity (Lyons-Ruth, Lyubchik, Wolfe, & Bronfman, 2002; Reck et al., 2004). In addition, depressed mothers are often more hostile or harsh (Lovejoy et al., 2000; Lyons-Ruth et al., 2002), and more critical and disengaged (Goodman, Adamson, Riniti, & Cole, 1994; Rogosch, Cicchetti, & Toth, 2004). Studies have shown that depressed mothers display less positive affect and more frequent expressions of sadness (Cohn, Campbell, Matias, & Hopkins, 1990), are less effective in their communication with their children (Hammen, Burge, & Stansbury, 1990), and are more withdrawn or unresponsive (Field, 1992). In addition to these ineffective parenting practices, mothers who are depressed are at increased risk for experiencing stressful life events, such as marital conflict (Beardslee et al., 1998). Depending on the stressor, the child may also be exposed to it while potentially receiving inadequate

buffering from the caregiver. Fortunately and importantly, depressive symptoms are treatable, and changes in parents' depressive symptoms predict changes in their children's depressive symptoms (Garber, Ciesla, McCauley, Diamond, & Schloredt, 2011).

Children of depressed mothers are not only at increased risk for experiencing depression themselves (Beardslee et al., 1998; Weissman et al., 2006), but are at risk for a range of negative social and emotional outcomes. Infants of depressed parents exhibit higher levels of withdrawal and irritability (Lundy, Jones, Pietro, & Saul Schanberg, 1999). In preschool and elementary school, children of depressed mothers exhibit increased externalizing problems (Alpern & Lyons-Ruth, 1993; Kim-Cohen, Moffitt, Taylor, Pawlby, & Caspi, 2005). Infants and toddlers of depressed mothers are also likely to display more negative and fewer positive emotions during their interactions (Reck et al., 2004). The representational models of children of depressed mothers are more likely to incorporate a view of the self as unloved (Cicchetti & Toth, 2006b), which may serve as a foundation for a depressotypic developmental organization (Cicchetti & Toth, 1998). Children of depressed mothers may also have heightened negative emotionality and low positive emotional expression (Klein, Durbin, & Shankman, 2009). Much less work has been done on the effects of paternal depression on children; however, given the importance of maternal depression and the increasing role of fathers in caregiving, this work is badly needed.

Parent–Child Attachment Security

The quality of the parent–child relationship, and attachment in particular, has received a great deal of attention from the earliest work on psychosocial development. Guided by Bowlby (1969/1982) and Ainsworth (1979), attachment researchers have long been interested in how experiences in early caregiver relationships impact subsequent development. Compared to the young of many species, human infants are born relatively immature. As a result, they are highly dependent on their caregivers for survival. The attachment system, with the behavioral goal of seeking and maintaining proximity to the attachment figure during physical or psychosocial stress, may have evolved over time to promote survival (Bowlby, 1969/1982). From this perspective, children rely on their caregivers as a secure base, or safe haven, from which they can explore their environment. Over time, if the child has a primary caregiver who is warm, sensitive, and consistent, then the two are expected to form an attachment

relationship classified as secure in nature (De Wolff & van IJzendoorn, 1997). Differences in attachment security are thought to be carried forward in distinct working models of the attachment relationship and the self (Cassidy, Kirsch, Scolton, & Parke, 1996), and these representations are integrated into subsequent relationships thereby influencing social development and psychosocial adjustment (Waters, Vaughn, Posada, & Kondo-Ikemura, 1995).

Attachment insecurity is broadly considered a potential risk factor for later psychosocial disturbances, and attachment security as a protective factor. Early secure attachments promote positive expectations for the self and for others, thereby providing a platform for successful relationships and social competencies (Sroufe, Egeland, Carlson, & Collins, 2005). Securely attached children (according to attachment theory) should carry forward a view of themselves as capable and as deserving of having their needs met. They should also view others as trustworthy and dependable. This secure attachment history has been shown to promote more effective emotion regulation (Cassidy, 1994) and less vulnerability in the face of stressful life events (Mikulincer & Florian, 1998). Attachment insecurity, on the other hand, has been associated with the development of low ego resiliency (Arend, Grove, & Sroufe, 1979), which is characterized by inflexibility in the face of stress, and difficulties in recovery from challenges or failure (Eisenberg et al., 2004). Children with secure attachments have been shown to have higher self-esteem (Sroufe et al., 2005), more positive peer relationships (Schneider, Atkinson, & Tardif, 2001), and higher sociometric peer ratings (DeMulder, Denham, Schmidt, & Mitchell, 2000). Securely attached children also demonstrate lower rates of aggression (Renken, Egeland, Marvinney, Mangelsdorf, & Sroufe, 1989) later in development. In contrast, insecure attachment is predictive of internalizing and externalizing and disorders (Buist, Dekovic, Meeus, & van Aken, 2004; Lyons-Ruth, Easterbrooks, Cibelli, & Davidson, 1997).

There are many factors that are thought to influence the quality of the parent–child attachment relationship, and an insecure attachment alone is not necessarily a strong predictor of negative psychosocial outcomes. Instead, as bioecological systems theory would suggest, whether attachment security serves as a risk factor is dependent on other experiences in the child's life (Sroufe, Carlson, Levy, & Egeland, 1999) as well as other characteristics of the child. Insecure attachment heightens the risk for potential psychosocial difficulties for children growing up in poverty, with family instability, or parental dysfunction (Coyl, Roggman, & Newland, 2002; Greenberg,

1999). Others have demonstrated that insecure attachment confers risk in conjunction with maternal psychopathology (Teti, Gelfand, Messinger, & Isabella, 1995), high stress, and childhood maltreatment (Cicchetti & Barnett, 1991). Indeed, infants, toddlers, and children with depressed mothers are more likely to demonstrate an insecure attachment (Martins & Gaffan, 2000). Maltreated children are not only more likely to develop insecure attachment relationships, but are also more likely to form disorganized attachment relationships (van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). In the presence of their caregiver, disorganized infants may display simultaneous avoidance along with strong contact seeking, apprehension or fearfulness, and undirected or incomplete exploratory patterns (Dozier, Stovall, & Albus, 1999). Disorganization is thought to emerge when an infant continuously seeks comfort from a caregiver who is frightening to them and disorganized attachment is linked to several maladaptive outcomes such as poor conflict resolution (Wartner, Grossmann, Fremmer-Bombik, & Suess, 1994), aggression (Lyons-Ruth, 1996), and internalizing and externalizing problems (Groh, Roisman, van IJzendoorn, Bakermans-Kranenburg, & Fearon, 2012; Lyons-Ruth et al., 1997). Thus, taken together, there is strong and consistent evidence that maternal psychopathology including depression, child maltreatment, and insecure parent–child attachment co-occur and negatively impact children's social-emotional development. In particular, children's development of a positive sense of self, relationships with peers, and both internalizing and externalizing symptoms suffer in the context of these high-risk home environments.

High-Risk Child-Care Environments

Low-Quality Child Care

Nonparental child care is now the norm for young children in the United States, with 77% of children cared for by someone other than a parent, according to the Spring 2010 Census Report which utilized data from the 2008 Survey of Income and Program Participation (Laughlin, 2010). Aspects of the child-care environment can influence children's development, but the effects appear to be more modest than those attributable to the family (e.g., NICHD ECCRN, 2005), and when family and child-care risk factors co-occur, the effects of child-care factors may be overshadowed by home factors. For example, Deater-Deckard, Pinkerton, and Scarr (1996) found

that variations in child-care quality were unrelated to behavioral adjustment when differences in the home, such as SES and stress, were controlled for. Evidence now suggests that exposure to more child care early in life does put children at risk for externalizing problems, though the effect sizes are quite modest (Belsky et al., 2007). Child-care quality (measured through characteristics such as caregiver educational level and sensitivity, staff–child ratios, and environmental factors) has been repeatedly demonstrated to have positive effects on social-emotional outcomes. This may be particularly true for children from low-income or high-risk environments (e.g., Bradley, McKelvey, & Whiteside-Mansell, 2011; Clarke-Stewart, Vandell, Burchinal, O'Brien, & McCartney, 2002; Deater-Decker et al., 1996; Howes & Olenick, 1986; NICHD ECCRN, 2002; Peisner-Feinberg et al., 2001; Vortuba-Drzal, Coley, & Chase-Landsdale, 2004).

Child-care quality is typically assessed using either process or structure assessment measures (Lamb & Ahnert, 2006). Process measures utilize observation methods of the child-care setting including aspects of the physical environment itself (e.g., health and safety measures), as well as children's interactions with caregivers and other children (Vandell & Wolfe, 2000). Structured assessments focus on adherence to recommended guidelines such as caregiver training or maintaining appropriate adult and child ratios. Typically, process and structured measures are related. When caregivers are less trained and are receiving lower salaries (and typically fewer benefits), children's activities tend to be less stimulating and caregivers less responsive (Vandell & Wolfe, 2000). Therefore, central to the idea of quality is the maintenance of standards that will ensure child safety and an optimal environment for development.

On average, the quality of child care in the United States is inadequate (NICHD ECCRN, 2000; Whitebook et al., 1990), and the paucity of high-quality infant/toddler child care is particularly problematic (Vandell & Wolfe, 2000). Although provider training and education have improved, average group size and staff turnover rates remain an issue (Lamb & Ahnert, 2006), and low-quality child care is more likely among children living in poverty despite a number of interventions including Head Start and state-sponsored programs (Phillips, Voran, Kisker, Howes, & Whitebook, 1994). Intensive intervention programs such as the Perry Preschool Project (Schweinhart et al., 2005) and the Abercedarian project (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002) demonstrate the potential long-term protective value of high-quality early education for high-risk

children, like those living in poverty, but efforts to bring these programs to scale have so far encountered insurmountable barriers.

An accumulating body of evidence has also established a modest link between child-care quality and children's developmental trajectories demonstrating that children who experience high-quality child care score higher than children who experience low-quality child care on a variety of child development measures (e.g., Phillips & Howes, 1987). Specifically, better child-care quality is associated with higher levels of sociability and compliance, better peer relationships, better attention regulation, and fewer behavior problems (Gormley, Phillips, Newmark, Welti, & Adlestein, 2011; McCartney et al., 2010; NICHD ECCRN, 1998, 2001; Peisner-Feinberg et al., 2001). However, the link between child-care quality and social functioning might be dependent on child characteristics, such as temperament (Pluess & Belsky, 2010).

Through their daily interactions of supervision and instruction, child-care providers and young children develop close attachment relationships characterized by proximity seeking, reassurance, and other secure-base behaviors (Barnas & Cummings, 1994; Howes & Ritchie, 1999). As with parents, we should expect variability in the degree of sensitivity and responsiveness that teachers offer each child within their care. However, child-care classrooms that have higher ratios will allow more attention to each child, and might make it more likely that the child and caregiver will develop a secure attachment relationship (Goossens & Melhuish, 1996).

Multiple Placements

Although child-care attendance alone is not necessarily predictive of negative psychosocial outcomes, multiple child arrangements for an individual child may be associated with risk (Youngblade, 2003). Roughly 15% of children attending nonparental care are in two or more child-care arrangements per week, which may include a combination of center-based care and less formal types of care (Adams, Tout, & Zaslow, 2007; Capizzano & Adams, 2000). Multiple arrangements may confer risk for development, particularly for children with negative temperaments (De Schipper, Tavecchio, van IJzendoorn, & van Zeijl, 2004). The instability associated with increased child arrangements may be stressful for the infant or preschooler who may experience these multiple settings as unpredictable or difficult to adapt to, and they may have less time to develop high-quality relationships with their caregivers or peers.

Experiencing more child-care arrangements before kindergarten has been associated with the development of less competent social skills (NICHD ECCRN, 1998; Youngblade, 2003) and greater frequency of externalizing problems (Bacharach & Baumeister, 2003). More recently, Morrissey (2009) corroborates these previous findings by demonstrating increases in problem behavior and decreases in prosocial behavior among 2–3-year-old children from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD) with multiple concurrent child-care arrangements. These effects were particularly salient for the younger children in this sample, and also for girls. Taken together, these results suggest that stability in child care early in life plays an important role for predicting psychosocial outcomes for both infants and preschoolers.

Teacher–Child Relationships and Attachment

Although attachment theory emphasizes the importance of early infant relationships with mothers for predicting specific child outcomes, attachment research increasingly includes attachment processes beyond infancy (Crittenden, 1992) and with multiple caregivers. Given the prevalence rate of preschoolers attending nonparental out-of-home care, included in this focus are child-care providers. Much of this research suggests that children with an insecure attachment to their primary caregiver are likely to have problematic interactions with both their peers and their teachers (e.g., Moss, Parent, Gosselin, Rousseau, & St-Laurent, 1996) and are less likely to develop a secure attachment with nonparental caregivers (Barnas & Cummings, 1994). However, the development of a secure attachment relationship with a teacher or child-care provider has been shown to be predictive of important psychosocial outcomes. With more confidence to explore the environment (Richters & Waters, 1991), preschoolers who are securely attached to their child-care provider have shown more positive school readiness (Tran & Winsler, 2011), more positive experiences when interacting with peers (DeMulder et al., 2000), higher levels of social skills (Burchinal et al., 2008), and less aggressive behavior (Ewing & Taylor, 2009). In addition, teacher closeness mediated the development of internalizing and externalizing behaviors for children who were insecurely attached to their mothers (O'Connor, Collins, & Supplee, 2012). These studies would suggest double protection from risk for a preschooler who is securely attached to both teacher and mother, and some potential compensatory effect of secure

attachment to teachers alone. Indeed, more recent work has shown that a secure attachment to the lead teacher in the child-care classroom, controlling attachment to mother, predicts a decreasing (non-stress-reactive) cortisol pattern across the child-care day (Badanes, Dmitrieva, & Watamura, 2012).

Thus, taken together, child-care characteristics including environmental quality, teacher–child relationships, and multiple or unstable placements interfere with social and emotional development by failing to provide the expected quality and stability of support that allows children to develop a secure and mature sense of self and adaptive skills for interacting with peers and adults.

Joint Effects of Home and Child-Care Environments

Although the literature is more limited, we next examine the mesosystem effects of the interconnections among child-care and home environments. A key question to ask is whether or not children exposed to both family risk factors (e.g., maternal depression, parenting quality) and child-care risk factors (e.g., low quality, caregiver insensitivity) are differentially affected as a double jeopardy model would suggest.

Studies examining the joint effects of low-quality home and child-care environments indicate that family risk factors and child-care risk together are more predictive of negative psychosocial outcomes, than either environment considered alone (Greenberg, Lengua, Coie, & Pinderhughes, 1999). High-quality child care matters more for children who come from disadvantaged home environments, suggesting the importance of the provision of compensatory care (Howes & Olenick, 1986; Peisner-Feinberg et al., 2001; Phillips, McCartney, & Scarr, 1987; Serpell & Mashburn, 2012; Vandell & Corasanti, 1990; Vortuba-Drzal et al., 2004).

Several studies have also found interactions between family risk and child-care risk when predicting children's social-emotional development, particularly prosocial behaviors, and internalizing and externalizing problems. The NICHD ECCRN (2002) found that when their child's care was of low quality and the home environment was characterized by high levels of sociocultural risk (i.e., family income-to-needs ratio, maternal depression, level of social support, financial stress, marital quality, and parenting stress), mothers were more likely to rate their children as having fewer prosocial behaviors, indicating a double jeopardy effect. In contrast, family sociocultural risk was not related to mothers' ratings of their children's

prosocial behaviors when they were cared for in high-quality child-care arrangements, demonstrating a compensatory effect.

Similarly, using a sample of low-income families, Vortuba-Drzal et al. (2004) found that high-quality child care attenuated the effects of less cognitive stimulation at home, demonstrating that compensatory care can act as a protective buffer with regard to behavioral problems. We also confirmed the importance of cross-context influences with findings from the NICHD SECCYD indicating that children who were experiencing a double jeopardy environment had more negative psychosocial outcomes (Watamura, Phillips, Morrissey, McCartney, & Bub, 2011). Specifically, mothers of children in home and child-care environments rated in the bottom third on quality assessments rated their children as having more internalizing and externalizing behaviors (Watamura et al., 2011). Similar findings have been reported in other studies (e.g., Howes & Olenick, 1986; Peisner-Feinberg et al., 2001; Phillips et al., 1987; Vandell & Corasanti, 1990), and the powerful role of harsh, withdrawn, and inconsistent parenting, alongside low-quality nonparental care in the early years of life, is also well documented (e.g., Loeb, Fuller, Kagan, & Carrol, 2004; Sameroff, 2006).

As the two environments where young children spend the most time and receive critical support for their developing capacities, child-care and home environments together influence the development of social and emotional wellbeing. Similarly, as parents and caregivers are the critical adult models and sources of support for social and emotional development, factors that interfere with positive, contingent, and responsive parenting and caregiving, such as maternal psychopathology and high demands on teachers, impair children's developing psychosocial skills. For children who suffer from both home and child-care environments with negative or inconsistent support, these effects are magnified. Results demonstrating double jeopardy point to the need for both integrated interventions targeting both environments and continued efforts to provide especially high-quality child-care environments for children facing risk factors at home.

Poverty

In the United States, although children make up only a quarter of the total population, they make up 36% of the poor population and 22% of all children are living in poverty (U.S. Bureau of the Census, 2010). Poverty

involves a constellation of risk factors that together create an especially high-risk environment for psychosocial development. Children living in poverty are more likely to manifest psychopathological symptoms and maladaptive social functioning than children who are not living in poverty (Bolger, Patterson, Thompson, & Kupersmidt, 1995; Brooks-Gunn & Duncan, 1997; Duncan, Brooks-Gunn, & Klebanov, 1994; Linver, Brooks-Gunn, & Kohen, 2002; McLoyd, 1998; Taylor, Dearing, & McCartney, 2004; Yeung, Linver, & Brooks-Gunn, 2002). In addition, the magnitude of the risk associated with living in poverty may increase with more exposure to these impoverished conditions (Dearing, McCartney, & Taylor, 2006). There are multiple pathways through which living in poverty may affect children's development, including factors inside and outside the home, as would be predicted by a bioecological perspective. Low-income children are more likely to experience negative neighborhood characteristics than are children who are not living in poverty. For example, children in poverty are more likely to be exposed to unsafe levels of lead and air pollutants (Brody et al., 1994; Evans, 2004), live in areas with inadequate lighting conditions, and to live in crowded and noisy neighborhoods (Sampson, Raudenbush, & Earls, 1997). Residential crowding and noise have been shown to be associated with emotional distress and elevated physiologic stress in children (Evans, 2001). Further, impoverished parents are constrained in their choice of high-quality child care or schools, with few resources for child development (Duncan et al., 1994; Torquati et al., 2011), poor municipal services, and less access to health care (Evans, 2004).

In addition to these neighborhood features, children living in poverty are at increased risk for experiencing negative emotional climates in the home. Impoverished children are more likely to experience less favorable parenting practices such as excessive punitiveness or coercion (Bradley, Corwyn, McAdoo, & Coll, 2001; NICHD ECCRN, 2005). For example, Bradley et al. (2001) demonstrated that low-income mothers were less likely to communicate effectively with their children and less likely to show both verbal and physical affection toward their children than mothers who were not living in poverty. They also found that impoverished mothers were more likely to spank their children and less likely to monitor them (Bradley et al., 2001). An abundance of evidence also suggests that the quality of the marital relationship may differ in impoverished families, with low-income children experiencing greater levels of family conflict (Emery & Laumann-Billings, 1998).

Families who become and remain poor may also experience family risk factors that have direct negative effects on children such as mental illness, substance abuse, and domestic violence. Economically disadvantaged mothers are more likely to experience psychological distress and psychological problems compared to their advantaged counterparts (Petterson & Albers, 2001). Impoverished mothers are also at greater risk for suffering from depressive symptoms, experience higher rates of stress, and lower levels of social support (Deater-Deckard et al., 1996; Greenberg et al., 1999). As a result, studies have shown that children from economically disadvantaged families exhibit lower levels of cognitive functioning, academic achievement, and psychosocial development than children from more advantaged families (Conger et al., 1992; Duncan et al., 1994; Mills et al., 2012; Smith, Brooks-Gunn, & Klebanov, 1997).

Conclusions

We simply cannot ignore the increased risks of living in poverty, which has insidious and intractable effects on parents' ability to provide their children with the supportive and enriching experiences that they deserve. The fact that child-care quality is still lower for children living in poverty despite decades of efforts to provide intervention child care suggests the need for more intensive and innovative approaches to reaching families and financing programs. Tackling the multidimensional nature of poverty-associated risk for home and child-care environments also requires a broad-minded and multisystem approach. Efficacious and promising interventions have been developed for intervening with families suffering from parental psychopathology, substance abuse, and those maltreating children and could be implemented on a much wider scale. Similarly, we know exactly what is involved in providing high-quality child care and what it costs to provide these programs.

The global Great Recession and its continuing effects have already had a significant negative impact on funding for programs for families in an economic climate where these programs are most needed. As states of the U.S.A. struggle with decreased federal funding and extended reduced revenues, this trend is likely to continue in the next few years, creating a new generation of children born after 2005 who are experiencing poverty and its myriad of associated risks during the critical early childhood period. Unfortunately, the research reviewed here suggests this will result in increased internalizing and externalizing problems beginning early in life, decreased

social skills, and negative views of the self. And if this happens, it will happen in the presence of known solutions to these problems, underutilized because of our lack of sociopolitical will.

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12

Classroom Peer Relations as a Context for Social and Scholastic Development

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During childhood, children spend much of their time in school where they meet and interact with classmates. Over the course of everyday interactions, children form different types of relationships with classroom peers and these ties have the potential to influence the way children feel and perform in school (Ladd, 2005). For example, classroom peer relationships have been linked to a number of important educational processes and outcomes, including children's classroom participation, school attitudes, social and psychological adjustment, and academic achievement (Hymel, Comfort, Schonert-Reichl, & McDougall, 1996). In fact, some scientists contend that the effects of peers on children's development are unique relative to those of other socializers, including parents, siblings, and teachers (see Ladd, 2005; Wentzel & Looney, 2007).

To be specific, peers appear to play a critical role in the orientations (i.e., behavioral, emotional, and cognitive) that children develop toward school, and these developments may ultimately influence the ways children participate and learn within the school environment. These underlying processes that link peer relationships and students' achievement appear to have both a direct (e.g., modeling academic skills, facilitating intellectual advances) and indirect (e.g., underlying social and emotional factors) impact on students' academic performance. In this chapter, we consider: (a) four

distinct types of classroom peer relationships (forms of relationship), (b) how children develop these relationships (relationship formation), and (c) the means by which relationships affect children (relationship processes and effects).

Forms of relationship.   Researchers who study peer relations in classrooms have identified three conceptually and empirically distinct types of relationships: friendships, acceptance or rejection by the peer group, and peer victimization (see Ladd, Kochenderfer, & Coleman, 1997). Peer acceptance/rejection refers to a child's relational "status" in a peer group, as indicated by the degree to which they are liked or disliked by group members (Asher, Singleton, Tinsley, & Hymel, 1979), whereas friendship has been defined as a voluntary, dyadic form of relationship that embodies a positive affective tie (Furman & Robbins, 1985; Howes, 1988). Peer victimization, in contrast, is a form of relationship in which a subset of the peer group (i.e., one or several peers; "bullies") frequently aggresses against specific children (i.e., "victims"), particularly those who may be unable to stop the harassment (Kochenderfer-Ladd & Ladd, 2001; Olweus, 1993; Perry, Kusel, & Perry, 1988).

A fourth type of peer relationship that children form in classrooms has been termed peer work partnerships (Ladd, Kochenderfer-Ladd, Visconti, & Ettekal, 2012; Ladd et al., in press). Children form and participate in peer work partnerships when teachers assign students to dyads or small groups and encourage them to complete academic tasks. As children work with multiple classmates over time, they begin to build reputations as either "good/desirable" or "bad/undesirable" work partners. Thus, in this chapter, four forms of peer relationships are considered and reviewed: peer group acceptance/rejection, friendship, peer victimization (bully/victim), and peer work partnerships.

Relationship formation.   To understand how children develop relationships with classmates, researchers primarily have studied the different ways that children interact with peers. In general, investigators have worked from the perspective that children's social competence is a principal determinant of the quality of the relationships they form with peers. Behaviors that antecede positive relational outcomes have been termed "social skills" or "social competencies." For example, because prosocial behaviors tend to predict the formation of positive relationships, such as peer acceptance and friendship, children who regularly exhibit these behaviors have been seen as manifesting social competence. In contrast, the absence of these

behaviors has been interpreted in terms of "skill deficits" (see Asher, Oden, & Gottman, 1977; Ladd & Mize, 1983), and actions (e.g., aggression and social withdrawal) that predict negative relationship outcomes, such as peer rejection or bully/victim relations, have been seen as indicators of "social incompetence" (see Bierman, Miller, & Stabb, 1987; Bierman & Montminy, 1993).

Relationship processes and effects. Studies designed to elucidate how classroom peer relationships influence children's educational performance have been predicated on the assumption that children's relations with classmates immerse them in processes (e.g., participation vs. exclusion, support vs. harassment, affirmation vs. ridicule) that affect their participation and adjustment in this context (e.g., school engagement, learning, perceived competence, emotional and psychological adjustment, etc.; see Ladd, 2003, 2005). It has been hypothesized that peer relationships bring different processes to bear upon children and, thus, vary in adaptive significance for school-related demands (see Ladd et al., 1997).

In the next several sections, consideration is given to four types of classroom peer relationships and their potential adaptive significance for children's school adjustment. Within each of these sections, theory and evidence is reviewed as a means of illuminating: (1) processes associated with relationship formation (e.g., social competence, incompetency), and (2) processes hypothesized to be responsible for relationship effects.

Classroom Peer Acceptance and Rejection

To understand how children become accepted versus rejected members of their peer groups researchers have examined how children's behavior with peers predicts their eventual social standing among classmates. Various forms of social competence and incompetence have been implicated as potential determinants.

Relationship formation. The processes of relationship formation are complex, and not all children achieve the same level of success at becoming accepted members of their peer group. It appears that children's social skills are important antecedents of this form of relationship (Howes, 1988; Ladd, 2005). In particular, children who exhibit prosocial skills, such as being cooperative and helpful, are more likely to become accepted by classmates (Ladd, Price, & Hart, 1988). Conversely, children who

exhibit aggressive or withdrawn behaviors with classmates are more likely to experience peer group rejection. In both cases, these behavioral propensities discourage relationship development, thereby affecting children's ability to fit in and develop positive ties with multiple classmates (Ladd & Burgess, 1999).

Relationship effects.   To learn about the effects that peer acceptance or rejection might have on children's school adjustment, researchers began by correlating measures of children's acceptance or rejection by classroom peers with indicators of their school adjustment (see Ladd, 2005). Peer group acceptance, in particular, has the potential to increase children's sense of inclusion as well as enhance their opportunities for engagement in academic tasks. Ladd et al. (1997) demonstrated that peer acceptance accounted for changes in kindergarteners' classroom involvement and academic progress that could not be attributed to other relational predictors, such as peer victimization and friendship. Additionally, it has been shown that children who report higher degrees of relatedness, a corollary of acceptance, showed greater school engagement, which in turn, predicted gains in academic performance over the school year (Furrer & Skinner, 2003). In contrast, findings showed that peer group rejection was associated with problems such as negative school attitudes, school avoidance, and underachievement during the first year of schooling and thereafter (Ladd, 1990; Ladd, Birch, & Buhs, 1999; Ladd & Burgess, 2001). Later in the elementary years, peer rejection was linked with loneliness (Parker & Asher, 1993), conduct problems (Ladd, 2006), lower emotional wellbeing (Ladd, 2006), and academic deficits (Ladd et al., 1997). Other data suggests that peer rejection may have long-term, negative educational consequences, such as dropping out of school, truancy, and underachievement (see Cairns & Cairns, 1994; Ladd, 2005; Parker & Asher, 1987).

These findings spurred additional investigation that was designed to elucidate *how* classroom peer group rejection affects children's adjustment in school. Largely, this work has been guided by two main "process" hypotheses. As is illustrated below, each of these hypotheses embodies differing, albeit related assumptions about the means (e.g., pathways of influence) through which peer group rejection affects children's school engagement and/or related aspects of their school adjustment.

1. Rejection stigmatizes children and limits their social and scholastic resources. It has been proposed that when classmates dislike persons within their group, they act in rejecting ways toward these children (e.g., ignoring, excluding

them from activities), and these behaviors become observable indicators of rejection not only for rejected children, but also for the larger peer group (Buhs & Ladd, 2001; Coie, 1990; Hymel, Wagner, & Butler, 1990). A likely consequence is that the more a child is recognized as rejected, the fewer opportunities he or she is likely to have for social engagement (i.e., interactions with peers). A related hypothesis is that peer rejection impairs children's school performance because, when individuals withdraw from, or fail to engage in, positive peer relationships, they are deprived of the interpersonal resources (e.g., peer affirmation and support, tutoring or mutual problem solving, being included in learning activities, study groups, etc.) that tend to facilitate social and scholastic adjustment (see Buhs & Ladd, 2001; Buhs, Ladd, & Herald, 2006).

Although examination of these hypotheses is incomplete, the evidence obtained thus far has been consistent with researchers' expectations. Extant data show that rejected children often become marginalized from the mainstream of peer activities (Ladd, Price, & Hart, 1990), become disengaged from classroom activities (Buhs & Ladd, 2001), and are excluded from participation by classmates (Buhs et al., 2006). Further, findings from the latter two investigations (i.e., Buhs & Ladd, 2001; Buhs et al., 2006) buttress the contention that exclusion operates as an impediment to children's achievement.

Perhaps the most compelling support for the rejection-limits-engagement hypothesis comes from a recent investigation conducted by Ladd, Herald-Brown, and Reiser (2008). These investigators traced children's movement in and out of classroom peer rejection across the grade school years and found that regardless of whether children were rejected during the early or later years of grade school, longer periods of rejection were accompanied by lesser growth in classroom participation. The most serious patterns of disengagement were found for children who were continuously rejected throughout grade school. In contrast, children who moved out of rejection and toward acceptance by their classmates were more likely to show gains in classroom participation.

Other data implies that the effects of peer rejection on children's engagement and opportunities for participation in peer activities may be fairly pervasive within the school context. That is, disliked or rejected children appear to exhibit higher levels of disengagement not only in relatively structured activities that occur in classrooms (e.g., cooperative learning groups; see Furman & Gavin, 1989; Johnson & Johnson, 2000), but also in relatively unstructured activities that occur outside the classroom (e.g.,

recess, playground periods; see Asher, Rose, & Gabriel., 2001; Ladd et al., 1990). For example, within the context of classroom peer activities (e.g., cooperative learning groups), disliked children are often the last to be chosen by peers for group work, and even when assigned to learning activities by teachers, these children sometimes remain isolated (Blumenfeld, Marx, Soloway, & Krajcik, 1996; Johnson & Johnson, 1985).

2. Rejection leads to negative perceptions of self and peers. Another hypothesis that has garnered considerable research attention is that classroom peer rejection affects children's attitudes and beliefs about themselves and others which, in turn, negatively impact their school engagement or achievement. The importance of this premise is underscored by evidence indicating that children's attitudes and beliefs about themselves are powerful determinants of school success (e.g., Bandura, Barbarnelli, Caprara, & Pastorelli, 1996; Grolnick & Slowiaczek, 1994; Pierson & Connell, 1992; Zimmerman & Bandura, 1994). For example, Guay, Boivin, and Hodges (1999) found that children who perceived themselves as less academically competent had less growth in achievement over a 3-year period.

Investigators interested in this hypothesis have tended to study how peer group rejection is associated with specific aspects of children's social cognitions, including cognitive representations of the self and others (McDowell, Parke, & Spitzer, 2002). Another related domain of investigation has been focused on how children's perceptions of self and peers mediate their psychological and school adjustment (e.g., Ladd, Ettekal, Kochenderfer-Ladd, Rudolph, & Andrews, 2013; Ladd & Troop-Gordon, 2003).

Evidence that reflects on these hypotheses indicates that grade-school children's exposure to peer group rejection was predictive of their propensity to see themselves as unlikable by others and as less competent socially and academically (Boivin & Begin, 1989; Boivin & Hymel, 1997). Further, there is some evidence that supports the hypothesis that young children's belief systems (e.g., how they view themselves and others) are directly related to their adjustment in school (e.g., Betts & Rotenberg, 2007). For example, Betts and Rotenberg (2007) found that 6- and 7-year-old students who viewed their peers as untrustworthy were less well adjusted in the classroom than were those who thought peers were generally trustworthy. These researchers also found that peer acceptance mediated the relationship between viewing peers as trustworthy and later adjustment such that children who viewed peers as untrustworthy tended to be less accepted by classmates and less well adjusted in the classroom.

Thus, research lends support for the idea that classroom peer rejection negatively affects children's perceptions of themselves and others, and these perceptions interfere with children's school engagement and adjustment. Evidence supports the notion that peer rejection impacts how children view their social world and that having a skewed perception of others may lead to negative consequences in the academic realm. Taken together, this evidence suggests that peer group rejection is an adverse relationship that limits children's classroom participation and impairs their self- and peer perceptions. Thus far, investigators primarily have focused on two processes—limited engagement opportunities and perceptual distortions—that may help to explain how rejection impacts children's school adjustment.

Besides peer group acceptance and rejection, most children participate in other types of peer relationships in classrooms. Considered within the next section is the role of classroom friendships in children's school engagement and adjustment.

Classroom Friendships

Friendships differ from children's peer group acceptance and rejection because they occur between pairs (i.e., dyads) of children, are created by a mutual consent, and exist only as long as both participants choose to be in the relationship. Friendship formation is less well investigated than the development of peer acceptance and rejection, and most of what is known comes from studies of young children. In school contexts, several aspects of friendships have been investigated including children's participation in a close or "best" friendship, the number of mutual friends they have in their classrooms, the duration of these relationships, and features that reflect the quality of a friendship (see Ladd, 2005).

Relationship formation.   In general, studies of how children become friends suggest that the same prosocial behaviors that contribute to classroom peer acceptance are also important for the formation of children's friendships. In addition, several other social processes are involved in progressing toward friendship. For instance, Howes (1983) found that young children who exhibited a mutual preference for interaction demonstrated skill at complementary and reciprocal play. Moreover, those who shared positive affect were more likely to form friendships with other children. Similarly, Gottman (1983) found that social processes such as communication clarity and

connectedness, information exchange, the ability to establish common-ground activities, exploration of similarities and differences, conflict resolution, positive reciprocity, and self-disclosure predicted how well two unacquainted children ultimately "hit it off." Although much less is known about the specific skills involved in forming friendships, evidence largely is consistent with the hypothesis that friendships, and particularly participation in supportive friendships, contribute to children's adaptation to school.

Relationship effects. To understand the effects of classroom friendships, researchers have attempted to identify the processes that occur in children's friendships and examine how these processes are linked with children's school adjustment. As illustrated in the next several paragraphs, two principal assumptions have channeled investigators' efforts to elucidate the means (e.g., pathways of influence) by which classroom friendships affect children's school adjustment. The first is that friendships engage children in positive processes (e.g., the exchange of instrumental, emotional, and physical support between friends) or model behaviors that foster school adjustment. The second is that friendships sometimes immerse children in negative processes (e.g., the occurrence of conflict, rivalry, betrayal between friends) that interfere with their adaptation to school.

1. Friendships offer instrumental, emotional, and physical support. One of the guiding premises in research on children's friendships has been that this form of relationship has the potential to provide children with assistance (e.g., help with social or scholastic problems) and a sense of emotional and/or physical security (Wentzel, 1998). It has also been argued that, in the school context, these forms of support may play an important role in promoting and sustaining children's classroom participation and other forms of school engagement (Berndt, Hawkins, & Jiao, 1999; Ladd, Kochenderfer, & Coleman, 1996). For example, friendship features such as intimacy, validation, and self-disclosure are thought to contribute to the development of children's self-esteem, which, in turn, promotes initiative and engagement in the classroom.

Studies of classroom friendships provide evidence that is largely consistent with these assertions. Investigators have found that, as young children enter school, those who maintain preexisting friendships or form new friendships in their classrooms tend to develop favorable school perceptions and perform better academically than peers with fewer friends (Ladd, 1990). Ladd et al. (1996) detected variability in the quality of the friendships that children formed as they entered school and found that children who saw their

friendships as offering higher levels of support and instrumental aid tended to view their classrooms as supportive interpersonal environments. Similarly, Wentzel (1998) found that children who felt supported by peers were more emotionally secure and engaged in the academic environment. The supportive nature of friends may also take a physical form. For example, children with friends are more likely than their friendless counterparts to report feeling physically safe and free from harassment in their school environment (Hodges, Boivin, Vitaro, & Bukowski, 1999).

A second theoretical assumption is that, as children progress through grade school, friendship status (i.e., the presence or absence of friends) and friendship features (e.g., friendship quality, processes) influence children's emotional or psychological adjustment. Findings from a study conducted with third through fifth graders showed that children with supportive friends felt less lonely in school (Parker & Asher, 1993). Along these lines, other researchers have found that young adolescents without friends are more lonely and depressed (Nangle, Erdley, Newman, Mason, & Carpenter, 2003) than those with friends. Further evidence indicates that young adolescents who have friends report higher levels of emotional wellbeing (Berndt & Keefe, 1995) and that emotional wellbeing is linked to positive classroom behavior and academic achievement (Connell & Wellborn, 1991; Wentzel, 1998; Wentzel & McNamara, 1999). These investigations, when considered in the context of evidence that internalizing difficulties tend to interfere with several aspects of classroom engagement (e.g., participation), advance the argument that friendship (and subsequent emotional wellbeing) may serve as an impetus for the development or maintenance of motivation in school.

2. Friends model adaptive behaviors.   Researchers have argued that friends can be motivators of school success by modeling socially acceptable behavior (Berndt et al., 1999). There is some empirical evidence to corroborate this claim. For example, it has been found that children and preadolescents with friends engage in positive social interactions (Azmitia & Montgomery, 1993) and prosocial behaviors (McNamara-Barry & Wentzel, 2006) with greater frequency than their friendless counterparts. One possible explanation for these findings is that, in their attempt to develop intimacy (a feature vital to the establishment of close friendships; Hartup, 1996), children may inadvertently emulate (i.e., model) their friends' propensity to engage others in positive social interactions. It is conceivable that the prosocial behaviors associated with such positive social exchanges (e.g., sharing, helping, reciprocity) may help cultivate children's motivation in the classroom.

Or, it is possible that emulating may be more intentional, given the premise that children tend to align themselves with goals—academic or otherwise—that coincide with those of their friends. For example, in one study, preadolescents who viewed their friends as having high academic goals behaved in ways that helped promote their own academic achievement (Wentzel, Filisetti, & Looney, 2007). Thus, modeling represents one potential way in which friendship facilitates children's school adjustment.

3. Friendships are a source of conflict and rivalry.   As investigators probed the features of children's friendships, it became apparent that not all of the processes that transpire between friends are supportive or positive. In studies where youth have been asked about the dynamics of their friendships, reports of interactions involving conflict, rivalry, and betrayal were not uncommon, and interactions of this type were mentioned by children and adolescents alike (e.g., see Berndt, 1986; Ladd et al., 1996; Parker & Asher, 1993; Youniss, 1980).

Only a few investigators have explored the relation between conflict processes in classroom friendships and children's school adjustment. The evidence assembled thus far implies that children who experience higher levels of discord in classroom friendships are at greater risk for school maladjustment, as reflected in indicators such as negative school attitudes, disaffection during the school day, and classroom disruptiveness. In one study conducted with kindergartners, it was discovered that children who reported higher levels of conflict in their classroom friendships were less prone to like school or experience positive emotions during the school day than children who experienced lesser conflict in their classroom friendships (Ladd et al., 1996). In studies conducted with adolescents, Berndt and colleagues (Berndt & Keefe, 1995; Berndt, 1996, citing an unpublished manuscript by Berndt & Miller, 1993) found that negative interactions between friends were associated with classroom disruptiveness. When this relation was examined longitudinally, it was discovered that participation in conflict-ridden friendships anteceded gains in disruptiveness over the course of a school year (Berndt & Keefe, 1995).

Together these studies suggest that, in addition to peer group acceptance, the forms and features of classroom friendships have the potential to shape children's school adjustment. The resources or risks these relationships create for children would appear to depend on the types of processes that specific friendships bring to bear on children.

A third relationship—bully–victim relations—has further implications for children's school adjustment. As explicated in the next section, victimization by schoolmates may have serious consequences for multiple aspects of children's school adjustment.

Bully–Victim Relations

Efforts to identify and study children who are caught in bully–victim relationships at school have expanded exponentially in recent years due to educators' and parents' concerns about school violence and children's safety in school (see Kochenderfer-Ladd & Troop-Gordon, 2010; Ladd, 2005). Accruing evidence suggests that peer harassment is a relatively age-invariant phenomenon, occurring at all levels of schooling, including the earliest school years (e.g., kindergarten and the primary grades; see Kochenderfer-Ladd & Wardrop, 2001; Ladd & Kochenderfer-Ladd, 2002).

Relationship formation. To understand how children become victims, many investigators have studied the behavioral and emotional characteristics of children who are frequently harassed by peers. Despite the typical characterization of victimized children as emotionally anxious, physically weak, socially isolated, and low in self-esteem, evidence suggests that children who are frequently harassed by peers can be differentiated into two behavioral subtypes—*nonaggressive victims* and *aggressive victims* (i.e., also called "passive" and "provocative" victims, respectively; see Olweus, 1978). Findings reveal that whereas nonaggressive victims tend to exhibit solitary, reticent, sensitive (e.g., feelings hurt easily), and submissive behaviors (Boivin, Petitclerc, Feng, & Barker, 2010; Coplan, Rubin, Fox, Calkins, & Stewart, 1994; Rubin, Burgess, & Hastings, 2002), aggressive victims more often display conduct problems and manifest overreactive, negative emotional states (e.g., anger, impulsivity, irritability, dysregulated affect; see Kumpulainen et al., 1998; Perry et al., 1988; Schwartz, 2000; Schwartz, Dodge, Pettit, & Bates, 1997; Schwartz, Proctor, & Chien, 2001).

Relationship effects. To investigate victimization's effects on children's school adjustment, investigators initially correlated measures of peer harassment with various indicators of children's school adjustment. Findings from these studies tied victimization to many forms of school maladjustment, including absenteeism, low grade point average, poor academic readiness,

classroom disengagement, and school avoidance (e.g., Iyer, Kochenderfer-Ladd, Eisenberg, & Thompson, 2010; Juvonen, Nishina, & Graham, 2000; Kochenderfer & Ladd, 1996; Ladd et al., 1997; Lopez & DuBois, 2005; Schwartz, Gorman, Nakamoto, & Toblin, 2005). In light of these findings, process hypotheses were advanced to better account for the relations observed between peer victimization and school maladjustment. Of these perspectives, the two that follow have received the most empirical attention.

1. Peer victimization promotes poor mental health.   It has been proposed that peer victimization produces psychological distress in children, and that the symptoms or dysfunctions that develop from these stressors are responsible for maladjustment in the school context. Thus, a key assumption within this process hypothesis is that the psychological problems that children develop as a result of peer victimization become the proximal causes of school disengagement.

   The evidence gathered to address this hypothesis has largely been consistent with researchers' expectations. For example, Ladd et al. (1997) found that young children who were exposed to high levels of peer victimization displayed increases in school avoidance and loneliness in school. It was reasoned that frequent harassment causes children to become preoccupied with feelings of social alienation and safety concerns to the extent that they have difficulty attending to school tasks, begin to dislike school, or seek to avoid school altogether. More recently, in an 18-month longitudinal study of 6- to 10-year-old students, Iyer et al. (2010) found that victimization not only predicted decreases in children's effortful control (i.e., ability to shift and focus attention and inhibit inappropriate behaviors), but victimization was also linked to poor academic outcomes via its effects on children's disengagement from classroom learning opportunities. From these findings, the authors reasoned that the distress brought about by bullying likely undermined children's ability, and desire, to focus their attention on classroom activities. Similarly, Schwartz et al. (2005) reported that, for a sample of third and fourth graders, victimization predicted increases in depression which, in turn, forecast gains in academic difficulties (i.e., GPA, achievement test scores) over a 1-year period. Finally, consistent with these findings, evidence from two studies of middle-school children suggest that the link between self-reported victimization and school adjustment (i.e., GPA, absenteeism) was mediated by psychological symptoms (e.g., low self-worth, loneliness, depression; Juvonen et al., 2000; Lopez & DuBois, 2005). Taken together,

the results of these studies suggest that victims of peer harassment are at high risk for school maladjustment and that psychological difficulties are one of the mechanisms responsible for this relation.

2. Peer victimization promotes poor physical health. Efforts to explicate the processes underlying the relations between peer victimization and school-related problems have primarily been devoted to examining the mediating role of various mental health difficulties. Alternate mechanisms have been proposed and investigated with comparatively less frequency but, nevertheless, warrant attention. For example, in recent years investigators have begun to examine physical health as a process underlying the link between peer victimization and academic functioning. Results from one study indicated that the combination of peer victimization and chronic abdominal pain was predictive of poor academic competence (i.e., decreased cooperation, assertion, and self-control in the classroom setting; Greco, Freeman, & Dufton, 2006). Another investigation revealed that peer victimization forecast gains in physical and psychological health problems which, in turn, predicted school functioning (e.g., absences, poor GPA; Nishina, Juvonen, & Witkow, 2005). These findings imply that victimization has the potential to both provoke and exacerbate physical ailments and health-related behaviors that may detract from children's engagement in learning and achievement in school.

Overall, studies of children's relations with classmates imply that peer relationships—particularly adverse ones—play an important role in both social and scholastic development. Moreover, there is a growing support for the premises that classroom peer rejection, friendships and peer victimization bring different processes to bear upon children and have differing effects on their school adjustment.

Peer Work Partnerships

Although not as well investigated, peer work partnerships also appear to be significant in shaping children's school adjustment. Peer work partnerships are created when teachers assign students to dyads or small groups for peer-mediated learning (PML) tasks. Teachers typically create these temporary work partnerships for PML to encourage children to interact with

classmates in ways that promote collaboration (i.e., harmonious teamwork) and learning.

Many forms of PML have been developed (e.g., peer collaboration and tutoring, group investigation, competitive and cooperative learning groups; see Damon & Phelps, 1989; Johnson & Johnson, 2000; Maheady, Mallette, & Harper, 2006; Slavin, 1995), and because PML has been shown to promote achievement in children of all ages (see Cohen, 1994), it has been widely utilized in schools. Evidence indicates that nearly 80% of elementary-school teachers use PML in their classrooms on a sustained basis (Antil, Jenkins, Wayne, & Vadsay, 1998; Puma, Jones, Rock, & Fernandez, 1993).

Although there is evidence attesting to the effectiveness of PML for academic learning (see Cohen, 1994), little is known about how children interact with classmates to form *productive* collaborative partnerships or how youth build reputations among their peers for being either good/desirable or poor/undesirable work partners. Recent empirical efforts to fill this void have been based on the premise that success in this relationship context is skill-based (i.e., dependent on children's social competence as collaborators), and that the skills children need to be effective collaborators differ, at least in part, from those needed to form other positive classroom peer relationships, such as peer acceptance, and high-quality friendships (Ladd et al., 2012). For example, when asking children what qualities make a classmate a good work partner, Kochenderfer-Ladd, Ladd, Visconti, and Ettekal (2010) found that children mentioned such collaboration-specific skills as staying on task, sharing ideas and suggestions with each other, listening, providing task-specific instrumental support, and working through disagreements.

Relationship formation. To learn more about the skills that enable grade school children to form effective peer work partnerships and that contribute to their reputations as either desirable or undesirable work partners, we undertook an investigation that was designed to: (1) identify grade-schoolers' collaborative skills, (2) evaluate the importance of identified skills for collaborative work, and (3) determine whether differences in skill use were related to children being viewed as more or less preferred work partners. Preliminary findings from this investigation are presented below (see also, Ladd et al., in press).

To address the first aim, we asked 113 ethnically and socioeconomically diverse third through fifth graders (i.e., 8- to 11-year-olds), in the context of individual open-ended interviews, to describe attributes that made someone

(a classmate) a "good" partner for collaborative tasks. Children were not limited in the number of attributes they gave (average number of responses was 3; range 1 to 7). We then grouped children's responses into descriptive categories and, from among these categories, identified those that were indicative of collaborative skills (i.e., skill "types"). Using this procedure, seven skill types were identified: (1) shares ideas (communicates and listens), (2) provides support, (3) stays on task, (4) acts in a cooperative manner (cooperation), (5) attempts to solve disagreements, (6) attentive/responsive to others or other's perspectives, and (7) maintains control of emotions and behavior. Further analyses revealed that these seven skill types could be condensed into four distinct skills labeled: (1) On Task, (2) Cooperative Skills (e.g., exchanging information, cooperative communication, attentiveness, responsiveness), (3) Support and Concern, and (4) Integrity (i.e., fair, self-regulated, problem solving).

Next, to evaluate the importance of the identified skill types for collaborative work, we created a measure using items descriptive of the attributes children provided, and asked a sample of 212 students to indicate how important each of the skills were for working together (i.e., "If you needed a partner for school work, how important would it be for your partner to. . . ?"; scaled 0 = not at all to 3 = very important). Results showed that although children viewed all of the skills as important (all $Ms > 2.00$), being on task was viewed as the most important skill ($M = 2.47$, significantly higher at $p < .05$ than all others), followed by Integrity ($M = 2.28$), Cooperative ($M = 2.20$), and Support and Concern ($M = 2.15$).

Finally, to determine whether children's skill use was related to classmates' work partner preferences ("partner preference"), we asked students to indicate how much each classmate *used* the various skills (0 = never to 3 = most of the time) as well as how much they would like *to work with* each classmate if they needed to work with a partner on a class assignment (1 = not much, 3 = kind of, and 5 = a lot). The ratings participants received from classmates were averaged and standardized within classrooms. Results indicated that all four skill types—i.e., On Task (e.g., works hard until done, focuses on work), Cooperative Skills (e.g., listens, shares ideas, helps partner, takes turns), Support and Concern (e.g., makes partner feel okay if they make a mistake, tells partner they are doing a good job, tries to understand partner's point of view), and Integrity (e.g., does fair share, works through disagreements—correlated positively with partner preference. Moreover, Cooperative Skills and Support and Concern emerged as unique predictors of partner preference after controlling for

peer acceptance, thereby suggesting that these skill types are particularly important for the formation of work partnerships.

Relationship effects. Thus far, few researchers have investigated the effects that peer work partnerships may have on children's school adjustment or described the processes that tend to occur within these relationships that may influence academic progress. However, evidence from the study described above provides preliminary support for the contention that such relationships are associated with positive educational outcomes. Specifically, we (Ladd et al., in press) found that children who were rated higher as preferred work partners were significantly more likely to be rated by teachers as making better academic progress (as measured by ratings in reading, math, spelling and oral language). Moreover, latent class analyses revealed that more skilled collaborative partners (i.e., those receiving higher ratings on the four skills: On Task, Cooperative, Support and Concern, and Integrity) performed at higher academic levels than their less-skilled counterparts.

Unfortunately, insight into how peer partnerships influence children's school adjustment (i.e., pathways of influence) remains limited. After decades of research on PML, it is clear that more has been learned about the outcomes of these activities (e.g., learning, achievement) than about the peer processes that produce the effects (see Blumenfeld et al., 1996; Bossert, 1988; Cohen, 1994; Furman & Gavin, 1989; O'Donnell, 2006). However, researchers have begun to articulate hypotheses about the means (e.g., pathways of influence) by which collaborative relationships affect children's school adjustment.

Collaborative relationships provide interpersonal and psychological resources that support both social and scholastic learning. Researchers who promote the use of PML in classrooms typically work from the hypothesis that the interpersonal and cognitive resources offered by peers in such contexts enhance children's learning and achievement. For example, it is argued that peer learning builds on individuals' strengths and mobilizes them as active participants in the learning process. Not only do students learn material better and deeper, but they also gain transferable social and emotional skills such as helping, cooperation, listening, and communication (Topping, 2005). It has also been argued that the nature of the interactions that tend to occur between peer partners (e.g., debate, encouragement, helping) increases children's engagement in learning and thereby promotes achievement (e.g., Johnson & Johnson, 1985). Working toward a common goal, as

in the case of interdependent work structures typical of collaborative learning contexts, promotes peer encouragement, reinforcement of effort, and the establishment of norms emphasizing academic achievement (Rohrbeck, Ginsburg-Block, Fantuzzo, & Miller, 2003).

Collaborative peer relationships also provide a context that challenges (motivates) and supports (maintains) children's learning (Azmitia, 1988; Azmitia & Montgomery, 1993). It has been posited, for example, that collaboration within peer relationships enables children to co-construct shared understandings of assignments and task outcomes (see Damon, 1984; De Lisi & Golbeck, 1999 for reviews). Collaborative interactions also may advance children's thinking and problem solving through processes such as conflict, debate, and perspective taking (Piaget, 1985). In this way, collaborative ties encourage children to challenge themselves, experiment with new approaches to problem solving, risk mistakes, and so on. Further, because peer partnerships encourage active rather than passive modes of learning (e.g., via collaborative interactions; see Maheady et al., 2006), they may foster deeper levels of processing and more robust forms of learning. For example, Topping (2005) suggests that through peer learning, students more fully grasp material by having to explain concepts to another, thereby embodying and crystallizing thought into language. Thus, listening, explaining, questioning, summarizing, speculating, and hypothesizing skills are developed.

However, support for these theoretical contentions is limited and there is evidence to suggest that not all of the interactions that occur in PML activities are positive or conducive to learning (e.g., planful, constructive, helpful, supportive, etc.). For example, some children dominate others, loaf instead of participate, ignore or exclude others from conversations, and so on (see Blumenfeld et al., 1996). It has also been found that many teachers think they are implementing cooperative learning when they are merely putting students together in dyads or small groups. For example, Bennett, Desforges, Cockburn, and Wilkinson (1984) discovered that children assigned to work in groups for collaborative learning activities (CLA) tended to end up working primarily alone. They also reported that only one sixth of CLA time was spent interacting with other classmates, and most of this was unrelated to the task. Thus, much more remains to be learned about peer partnerships, the processes that transpire in these relationships, and the role that specific processes play in children's learning and school adjustment.

Summary and Conclusions

Researchers have studied peer relations in school contexts primarily to learn about how children form relationships with classmates, and to gain insight into how these relationships might affect their adjustment and performance in school (see Ladd, 2005; Parker & Asher, 1987; Wentzel & Looney, 2007). Although both positive (e.g., friendships, effective peer work partnerships) and negative (e.g., peer group rejection, peer victimization) forms of relationship have been researched, the evidence assembled thus far has more to say about relationships that have the potential to impair rather than improve children's school adjustment and progress.

Shifting the Emphasis of Classroom Peer Relations Research: Identifying Relationships and Relationship Processes That Benefit Children

As illustrated in this chapter, considerable support has been found for the hypothesis that adverse relations with classmates (e.g., peer rejection, victimization, and friendlessness) are associated with children's adjustment problems in school. Further, a growing corpus of findings have begun to isolate and identify specific relational processes (e.g., exclusion from learning activities, harassment) that may be responsible for specific adjustment problems (e.g., negative school attitudes, school disengagement, under-achievement; Buhs & Ladd, 2001; Ladd, 1990), and place children on unfavorable long-term adjustment trajectories (see Buhs, Ladd, & Herald, 2006; Ladd et al., 2008).

The question of whether classroom peer relations serve beneficial purposes for children in the school context has, by comparison, received far less investigative attention. Little is known, for example, about aspects of children's classmate relationships that might increase their engagement in classroom activities or foster achievement. Moreover, if children do profit from some aspects of their relations with classmates, we know even less about the relationship processes that might be responsible for such effects.

Erasing this void in our knowledge could prove useful from a scientific as well as an applied point of view. Scientifically, studies aimed at these objectives could help shift the "dysfunction-oriented" paradigms that dominate peer relations research today toward frameworks that emphasize positive development, competence, and wellbeing. Rather than continuing to ask

questions such as "How do adverse peer relations foster social and scholastic dysfunction?", researchers could concentrate their efforts on questions such as "What aspects of children's relationships with classmates promote their social and academic competence?" From an applied perspective, gaining a better understanding of the peer processes that enhance children's development in school contexts would be consistent with contemporary school improvement initiatives, and the resulting discoveries could have far-reaching implications (e.g., impact on educational policies, practices, and reforms). Educational researchers could embrace this challenge by investigating classroom peer processes that, theoretically, have the potential to improve grade-school children's interpersonal and scholastic development.

Future Research Objectives

The preceding logic suggests that there is a need to create feasible, realistic (usable), and effective practices for promoting positive classroom peer relations (and, in so doing, preventing/reducing adverse peer relations). To achieve this objective, it will be necessary to work from the assumption that classroom peer processes are malleable and can be molded in ways that bring about positive developments for the majority of children who are members of classroom peer groups. The probability of achieving this objective, although difficult to estimate, appears favorable in light of evidence indicating that classroom peer group processes are responsive to environmental manipulations. Potential avenues for investigation include practices that incorporate specific instructional, organizational, and contextual manipulations (e.g., differential classroom practices, programs, curricula).

The methods that teachers use to group classmates for learning activities (i.e., PML or peer-mediated learning) appear to be a particularly promising avenue of investigation. Although PML activities, such as investigative teams, peer collaboration and tutoring, and competitive and cooperative learning groups (Damon & Phelps, 1989; Johnson & Johnson, 2000; Maheady et al., 2006; Slavin, 1995) have received considerable research attention and are widely used methods in American schools, we currently know more about the *academic* (e.g., cognitive learning) rather than the *social* processes and effects of these activities (see Blumenfeld et al., 1996; Bossert, 1988; Furman & Gavin, 1989; O'Donnell, 2006). Proponents of PML have argued that peer processes (e.g., peer encouragement, helping, cooperation) are fundamental to many types of PML activities and should, in theory, enhance not only children's academic learning but also their

social relations with classmates (e.g., improve friendships and peer group acceptance; Bossert, 1988; Johnson & Johnson, 1985). However, empirical documentation of the actual peer processes that occur within PML activities and the links between such processes and specific academic and social outcomes remains limited (Bossert, 1988; O'Donnell, 2006).

Some data, for example, suggests that children become more prosocial as a result of participating in PML (e.g., cooperative learning groups; Hertz-Lazarowitz, Sharan, & Steinberg, 1980; Johnson, Johnson, Johnson, & Anderson, 1976). However, other data suggest that classmates do not always act prosocially toward, or work to benefit, members of their groups (see Blumenfeld et al., 1996). Evidence is also mixed on the effects of PML on children's broader classroom peer relations (e.g., peer group acceptance and friendships), but positive effects have been reported in the majority of studies in which investigators have examined these types of relational outcomes (for reviews, see Furman & Gavin, 1989; Slavin, 1983a). Findings from other studies imply that certain grouping strategies for PML (e.g., placing children from differing ethnic and racial backgrounds within the same groups) aid in the promotion of cross-ethnic/racial friendships (O'Donnell, 2006; Slavin, 1995). Here again, however, there is mixed rather than uniform support for this hypothesis (see Slavin, 1983b).

Thus, much remains to be learned about the peer processes that occur in PML and about the effects of PML on children's classroom peer relations and, ultimately, their school adjustment. Toward this end, three wide-ranging investigative agendas can be identified. First, most of the research on the peer processes and outcomes that are associated with PML is outdated (see O'Donnell, 2006) and should be updated and reevaluated with modern PML variants and with twenty-first–century samples, classrooms, and schools. Second, as part of this reevaluation, more detailed information should be gathered on the types of peer processes that occur in different types of PML activities, and on the classroom-peer-relational outcomes that are associated with these processes and, more generally, children's involvement in specific PML programs. Third, those who evaluate the social processes and effects of PML should consider whether the extent to which children profit from PML activities depends on the skills they bring to this context. Johnson and Johnson (1994) suggested that, in order for cooperative groups to be productive, students must first learn the requisite social skills inherent in high-quality collaboration, as well as be motivated to utilize them. Further, some researchers contend that the effects of PML on children's social competence tend to be weak and heterogeneous because

these activities do not overcome impediments such as children's problem behaviors and lack of social skills (Dion, Fuchs, & Fuchs, 2005). Thus, to maximize the benefits learners derive from these instructional contexts it may be necessary to devise and implement classroom practices that will prepare children for the social demands of PML.

Finally, there is a need for educators to experiment with different types of classroom peer contexts (e.g., dyadic, small group activities), tasks (e.g., cooperative, collaborative assignments), and processes (e.g., modes of interaction) as a means of discovering strategies that produce meaningful gains in children's social learning and academic achievement. Together, progress toward these objectives will yield not only a more comprehensive understanding of the social processes underlying children's collaborative learning, but also an empirical database that can be used to create technology (e.g., curricula, instructional methodology, etc.) for promoting social and scholastic learning in the classroom peer context.

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13

The Importance of Quality Prekindergarten Programs for Promoting School Readiness Skills

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In the 1960s and 1970s urban and rural poverty was rampant, and television brought images of the disparities faced by families and children born in these circumstances into living rooms across the country and the collective consciousness of the nation. In response, in 1965 the federal government created the Head Start program to provide comprehensive services to meet the health, nutritional, psychological, social, and emotional needs of young children from families living in poverty (Administration for Children and Families, 2012a). At the same time, impoverished communities in Michigan, North Carolina, and Chicago developed small-scale preschool programs to provide resources and learning opportunities for young children to improve their health, wellbeing, and achievement (Ramey & Ramey, 2004; Reynolds et al., 2007; Schweinhart et al., 2005). Experimental studies of the impacts of these three local preschool programs—Perry Preschool, Abecedarian, and Chicago Child-Parent Centers—found that for each dollar that was invested, the long-term economic benefits returned to society ranged from $2.50 to $16 through reductions in special education services, grade retention, and crime, and increases in high-school graduation, employment, and earned income (Mervis, 2011).

Due in large part to these three studies showing economic benefits of early intervention programs, there has since been a nationwide movement to create and expand opportunities for young children who experience economic disadvantages to attend preschool. Currently, over $13 billion is spent each year by the federal government ($8.1 billion for Head Start) and states ($5.5 billion) to operate public preschool programs for 3- and 4-year-olds (Administration for Children and Families, 2012b; Barnett, Carolan, Fitzgerald, & Squires, 2011). Most of these funds are used to provide public prekindergarten (pre-K) programs, defined as any formal program for 4-year-old children, in the year prior to kindergarten, intended to promote the comprehensive set of skills they need to enter school ready to learn. In 2009 approximately 75% of 4-year-olds attended a pre-K program, with approximately half enrolled in publicly funded programs—either Head Start or state-funded programs currently operating in 40 states (Barnett et al., 2011). This represents a 400% increase since 1964 in the prevalence of 4-year-old children who attend pre-K (Barnett & Yarosz, 2004).

The relatively large investment of public funds to provide pre-K is based on the promise that attending will improve children's school readiness and long-term success and reduce achievement gaps between children from disadvantaged and more advantaged homes (Pianta & Howes, 2009). However, the promise of pre-K to achieve these goals will not be met by simply providing *access* to programs; learning and development depends upon the *quality* of children's daily experiences within these programs. Although "high quality" is a ubiquitous term used to characterize federal and state pre-K programs, research investigating the importance of high-quality pre-K on children's school readiness has generated mixed evidence about the specific features of pre-K settings that have a positive effect on multiple dimensions of school readiness. As a result, policy makers, program administrators, center directors, and teachers who are charged with delivering high-quality pre-K are offered little guidance from research about how to structure and implement programs in ways that will have the greatest impacts on the children who attend.

The purposes of this chapter are to: (a) summarize the extensive body of research about the associations between high-quality pre-K and children's school readiness; (b) describe methodological limitations and conceptual problems with this research; and (c) discuss the contributions of developmental theories to informing the design and structure of pre-K settings that best support children's school readiness. Specifically, the first section of the chapter provides a summary of the multiple definitions and multiple

measures of high-quality pre-K and children's school readiness that have been used in research. The second section illustrates the mixed conclusions that have been generated from decades of research investigating associations between pre-K quality and children's school readiness. The third section describes limitations in the study methods and problems with the conceptual underpinnings of the research, which have limited its applicability to informing effective policy and classroom practices that improve children's school readiness. The final section briefly summarizes theories of young children's development and identifies features of, and experiences in, pre-K settings that align with children's developmental needs. The goal of this chapter is to refocus the definition of high-quality pre-K on those aspects of pre-K programs that directly impact children's development; the result of this will help to clarify the policies and program improvement efforts that are most likely to amplify the impacts of attending pre-K on children's school readiness and later success.

Defining and Measuring High-Quality Pre-K and Children's School Readiness

"High-quality pre-K" is a broadly defined term used by parents, teachers, program administrators, and policy makers that refers to a wide range of features of pre-K settings that are presumed to be beneficial for children who attend. This definitional ambiguity is reflected in the wide range of measures of high-quality pre-K that have been used in research examining associations between pre-K quality and children's school readiness. For example, across this vast literature, measures of high-quality pre-K have included background characteristics of teachers, services provided by programs, space, furnishings, and materials available to children in the classroom, and the nature of interactions between teachers and children.

To reduce this ambiguity, definitions of high-quality pre-K have been placed into one of two broad categories—structural quality and process quality (Lamb & Ahnert, 2006; Vandell & Wolfe, 2000). Structural quality is defined as the features of pre-K programs that are regulated through policies, such as the training and education requirements for lead and assistant teachers, the number of children and teachers in each classroom, and any additional services the programs provide for children and families. Professional organizations such as the National Institute for Early Education Research (NIEER; Barnett et al., 2011) and the American Public Health

Association and the American Academy of Pediatrics (1992) have been lead advocates for defining these minimum standards of structural quality and measuring the quality of pre-K programs using these criteria.

For example, NIEER defines high-quality pre-K as whether programs adhere to the following 10 minimum standards (Barnett et al., 2011):

1. Lead teachers have a bachelor's degree or higher;
2. Lead teachers have specialized training in a pre-K area such as early childhood education or child development;
3. Assistant teachers have a Child Development Associate (CDA) degree or more;
4. Teachers participate in at least 15 hours of professional development each year;
5. Classes have 20 children or fewer;
6. The child-to-teacher ratio is 10-to-1 or better;
7. The curriculum addresses multiple domains of children's development;
8. The program provides children screenings and referrals for vision, hearing, and health and at least one additional support service to families;
9. At least one meal is served each day;
10. The program participates in site visits to monitor adherence to the above program standards.

Measuring structural quality is directly aligned with the above definition. Programs that adhere to each standard are rated as achieving high quality on that particular dimension, and overall quality of programs is determined by counting the number of minimum standards of quality to which programs adhere (Barnett et al., 2011).

The second category of pre-K quality—process quality—refers to the range of features within pre-K settings that children directly experience on a daily basis. Specific dimensions of pre-K process quality include the condition of the furnishings and equipment in the indoor and outdoor space, the availability of, and access to, learning materials to use during art, fine motor, dramatic play, literacy, math, and science activities, and the degree to which teachers are supportive of children's emotional and instructional needs (Hamre & Pianta, 2007; Harms, Clifford, & Cryer, 1998; Mashburn, 2008; Mashburn et al., 2008). Measuring process quality typically involves classroom observations through videotapes or in-person visits to the classroom in which trained raters apply standardized protocols to assess the quality of features of the physical and/or social environments available

to children during a typical day. Observational measures have been developed to assess various dimensions of process quality, including the overall quality of the pre-K environment (Harms & Clifford, 1980; Harms et al., 1998), the quality of the physical resources available to children in the setting (Abbott-Shim & Sibley, 1998), the quality of the social interactions between adults and children (Arnett, 1989; Pianta, La Paro, & Hamre, 2008), and the quality of the physical and social resources that promote specific developmental outcomes such as literacy and language skills (Smith, Brady, & Anastasopoulous, 2008) and math and science skills (Pitburn et al., 2000).

Two observational measures of pre-K process quality that have been most commonly used in research are the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008) and the Early Childhood Environment Rating Scale (ECERS; Harms & Clifford, 1980; Harms et al., 1998). The CLASS (Pianta et al., 2008) assesses the quality of social interactions between teachers and children, and observations produce scores for the quality of Emotional Support, Instructional Support, and Classroom Organization (Hamre & Pianta, 2007). The revised version of the Early Childhood Environment Rating Scale (ECERS-R, Harms et al., 1998) comprises 43 items that assess the following seven theoretical dimensions of process quality within pre-K environments: Space and Furnishings, Personal Care Routines, Language-Reasoning, Activities, Interactions, Program Structure, and Parents and Staff. Although there are conceptual distinctions between these seven theoretical dimensions, the intercorrelations among these seven scales tend to be high, and the internal consistencies of items within each scale tend to be low. As a result, research using the ECERS-R has either summarized across all items to measure the Overall Quality of a pre-K program along a single dimension or along two dimensions that assess the quality of Teaching and Interactions and the quality of Provisions for Learning (Cassidy, Hestenes, Hegde, Hestenes, & Mims, 2005; Perlman, Zellman, & Le, 2004; Sakai, Whitebook, Wishard, & Howes, 2003).

The distinction between structural quality and process quality is an artificial one for some features of pre-K settings. For example, the amount of physical space in the classroom can be regulated through policies that set minimum standards regarding square footage per child, and the physical space is part of the child's direct experiences in the classroom. Despite the fact that some aspects of structural quality and process quality are not mutually exclusive, these two broad categories create a helpful heuristic for organizing the wide-ranging features of programs that are used to define and measure "high-quality" pre-K.

Children need a variety of skills and competencies to successfully adapt to kindergarten, and the definition of "school readiness" used in research is as multifaceted as the definition of high-quality pre-K. One of the first attempts to formally define the multiple components of school readiness was by the National Education Goals Panel, formed by President George H. W. Bush in 1990 to establish and report on the nation's progress toward achieving six education goals by the year 2000 (National Education Goals Panel, 1991a). Goal 1 put forth by the panel was "By the year 2000, all children in America will start school ready to learn", and school readiness was defined as comprising the following dimensions: physical wellbeing and motor development, social and emotional development, approaches toward learning, language usage, and cognition and general knowledge (National Education Goals Panel, 1991b). Subsequent definitions of school readiness that have been adopted by states and school districts include these dimensions, and they have been expanded to include new child competencies (e.g., self-regulation, executive function) and to incorporate the capacity of the systems within which children develop (e.g., families, schools, and communities) to promote these competencies (e.g., Virginia Department of Education, 2010).

Numerous measures of children's school readiness are available to assess the multiple dimensions described above, as well as specific subscales within each dimension. As a result, the operational definition of school readiness is even more ambiguous than its theoretical definition. For example, cognition and general knowledge described by the National Education Goals Panel refers to children's early academic skills in the areas of literacy, language, and math; and multiple measures are available to assess skills in each area. Direct assessments of kindergartners' literacy skills may include measures of print knowledge, definitional vocabulary, and phonological awareness (e.g., Lonigan, Wagner, Torgeson, & Rashotte, 2007); language skills may include measures of receptive language, expressive language, and narrative skills (Carrow-Woolfolk, 1995; Dunn & Dunn, 1997; Pence, Justice, & Gosse, 2007); and math skills may include measures of conceptual knowledge (e.g., numeration, geometry, and measurement), computational skills (e.g., estimation, addition, subtraction), and problem-solving skills (Connolly, 2007; Woodcock, McGrew, & Mather, 2001). In addition to direct assessments of school readiness skills, teachers' ratings of children's social-emotional (e.g., Gresham & Elliott, 1990; Hightower et al., 1996) and academic skills (National Center for Education Statistics, 2002) are commonly used. Observational methods have also been developed to assess children's social

skills and task orientation within the classroom (Downer, Booren, Lima, Luckner, & Pianta, 2010). As discussed in the next section, the multiple measures of pre-K quality and multiple measures of school readiness have been used in volumes of research intended to identify the specific features of pre-K settings that have the strongest impacts on the multiple dimensions of school readiness.

Research on Prekindergarten Quality and Children's School Readiness

A primary research question currently facing early childhood researchers is "What are the features of and experiences in pre-K settings that produce the greatest impacts on school readiness and later achievement?" The answers to this question have the potential to inform decisions about how to structure and implement pre-K in ways that maximize its effectiveness. However, across a vast literature that addresses this simple question about the associations between structural quality, process quality, and school readiness, the results that have emerged are quite complex.

Research on the associations between structural quality and school readiness has commonly assessed quality as a sum of the total number of minimum standards to which a program adheres, and findings from these investigations have been mixed. For example, one study found that children enrolled in child-care centers that met more minimum standards recommended by the American Public Health Association and the American Academy of Pediatrics (1992) with regard to child–staff ratio, class size, caregiver training, and caregiver level of education performed better on cognitive, language, and social competence measures compared to children enrolled in classes that met fewer of these standards (NICHD ECCRN, 1999). Similarly, Howes (1990) found that the number of minimum standards that preschool programs met for child–staff ratio, class size, caregiver training, and physical space was positively associated with children's later adjustment in kindergarten. Contrasting results were found in a more recent study (Mashburn et al., 2008) that included nearly 700 publicly funded pre-K classrooms serving 4-year-olds in 11 states. This study examined whether classrooms that met nine of the minimum standards of structural quality recommended by the NIEER (Barnett, Hustedt, Robin, & Schulman, 2005) resulted in improvements in children's development during the school year. Findings indicated that none of these standards, which included teachers' education, teachers'

field of study, class size, and child-to-teacher ratio, alone or in combination, contributed to children's development of language, rhyming, problem solving, letter naming, or social skills during preschool (Mashburn et al., 2008).

Research has also investigated the contributions of individual measures of structural quality on children's learning and development. The most widely debated pre-K policy concerns the regulations for teachers' preservice training experiences—in particular, the minimum degree that teachers must have attained and the specific field of study of that degree. Variability in policies across programs results in a current work force of pre-K teachers with degrees ranging from high school, associate's, bachelor's, to master's, and in fields that include early childhood education, child development, other education, and other majors not related to education. The hypothesis driving this research about teacher preservice training has been that children will experience higher quality interactions and attain higher achievement during pre-K if enrolled in classrooms that have teachers with higher levels of education and specialized training in early childhood education or child development.

There has been some evidence from studies in the 1980s and 1990s to support this hypothesis (Cost, Quality & Child Outcomes Study Team, 1995; National Research Council and Institute of Medicine; 2001; Whitebook, Howes, & Phillips, 1989); however, a more recent study involving contemporary pre-K programs challenges this finding. Using data from seven large-scale evaluations of preschool programs that included over 7,500 children enrolled in nearly 3,000 classrooms, Early and colleagues (2007) found that teachers' level of education and field of study were neither associated with the quality of children's experiences in classrooms nor children's development of academic and language skills during preschool. Despite this evidence of null effects of teachers' level of education and field of study on improving children's school readiness, a policy enacted by Congress in 2007 increased education and training requirements for Head Start teachers. Specifically, by 2013, all Head Start teachers are required to have at least an associate's degree, and half of Head Start teachers nationally must have at least a bachelor's degree in early childhood education or a bachelor's degree with coursework equivalent to a major relating to early childhood education.

There are economic costs of this change in Head Start policy incurred from paying higher salaries to teachers when they attain their higher degree (Center for Law and Social Policy, 2005). Based upon the study by Early and colleagues (2007), these costs are not likely to be returned in economic

benefits resulting from children who experience greater short-term or long-term outcomes. However, advocates of policies to increase teacher qualifications point out the potential benefits of attaining higher degrees related to better integration of pre-K teachers into the K-12 system of education (Bogard & Takanishi, 2005) and increased professionalization of the field of early childhood education (Bellm & Whitebook, 2003).

Class size and child-to-teacher ratio have also been the focus of research on structural quality and children's school readiness, with the hypothesis that smaller classes and better ratios improve social processes within the classroom and, in turn, affect children's development. Despite the evidence from the study by Mashburn and colleagues (2008) showing that neither class size nor ratio contributed to children's development of academic, language, and social skills during pre-K, an earlier study finds positive support for child-to-teacher ratios. Specifically, a large-scale study of preschool classrooms found a positive effect of smaller child-to-teacher ratios on children's development of cognitive and social competence that was partially attributable to better quality caregiving that children experienced in their classrooms (NICHD ECCRN, 2002).

Curriculum type is another structural feature of pre-K settings that has been the focus of research investigating its contribution to school readiness. It is hypothesized that regulations mandating that programs adopt scientifically based curricula that address a comprehensive set of skills will structure learning activities in ways that ensure children are given ongoing and systematic opportunities to develop the early skills that are critical for later school success. Despite the proliferation of curricula available for pre-K programs, only some have demonstrated effects on children's outcomes; many have not, and many show effects in demonstration projects that do not replicate in follow-up studies (e.g., Assel, Landry, Swank, & Gunnewig, 2007; Barnett et al., 2008; Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008; DeBaryshe & Gorecki, 2007; Justice, Mashburn, Pence, & Wiggins, 2008; Preschool Curriculum Evaluation Research Consortium, 2008; Wasik, Bond, & Hindman, 2006).

As is evident from many of the results presented above, findings about the associations between structural quality and school readiness vary according to the time period when the studies were conducted. In particular, results from studies conducted in the 1980s and 1990s generally support the conclusion that structural features positively impact children's outcomes, whereas results from more recent studies find no effects. Although definitions and measures of structural quality have remained the same, one possible explanation

for the varied results over time has to do with differences in the types of programs that were involved in the studies during the different eras. Pre-K programs that participated in contemporary studies were likely part of publicly funded programs that are regulated by state or federal agencies and are monitored to ensure they adhere to these regulations. In these programs, some settings do and do not adhere to minimum standards, but because of program monitoring, it is likely that the magnitude of these differences is small. For example, contemporary classrooms that do not adhere to the maximum class size of 20 children likely have 21 or 22 children, which results in a small or indistinguishable difference in classroom processes that is unlikely to affect children's development. Contrast these programs with those from the 1980s and 1990s that were less likely to receive public funding and, as a result, experienced less oversight from a regulatory body. Across these classrooms, there was likely to be wider variability in structural features than in classrooms of today (e.g, class sizes that range from 20 to 30 children), which likely had a more profound impact on children's developmental outcomes.

Research investigating associations between process quality and children's school readiness has produced more consistent results than research about structural quality and school readiness. Across nearly every study, there is general support for the hypothesis that higher process quality is positively associated with children's development (Bryant, Burchinal, Lau, & Sparling, 1994; Dunn, 1993; Hestenes, Kontos, & Bryant, 1993; Howes, Phillips, & Whitebook, 1992; Howes & Smith, 1995; Lamb & Ahnert, 2006; Mashburn, 2008; Mashburn et al., 2008; NICHD ECCRN, 1999, 2002; Peisner-Feinberg & Burchinal, 1997; Peisner-Feinberg et al., 2001; Schliecker, White, & Jacobs, 1991; Vandell, Henderson, & Wilson, 1988). However, this general conclusion is weakened by limitations with the methods used to conduct these studies and problems with the conceptual framework guiding them.

Limitations and Problems with Research on Pre-K Quality and Children's School Readiness

The conclusion reached from prior research that process quality—including the physical resources and social interactions that children directly experience in pre-K settings—impacts children's school readiness is intuitive; however, there is a profound limitation with this conclusion. Across numerous studies

linking process quality and school readiness, the size of the associations tend to be small (NICHD ECCRN & Duncan, 2003), and in a few cases, they are nonsignificant (e.g., Chin-Quee & Scarr, 1994; Deater-Deckard, Pinkerton, & Scarr, 1996; Goelman & Pence, 1987; Kontos, 1991; Kontos & Feine, 1987). There are a number of possible explanations for this tenuous result, some of which are attributable to limitations with the methods that have been used to conduct these studies.

One methodological limitation relates to the multitude of measures of pre-K quality and children's school readiness employed across these studies. As discussed in the first section of this chapter, high-quality pre-K is theoretically defined as a multidimensional construct encompassing numerous features of pre-K settings, including the physical resources (e.g., space, furnishings, and learning materials) and social resources (e.g., nature of classroom activities and the social interactions between teachers and children), and the literature is replete with measures that assess different dimensions of quality. The definition of school readiness is equally elusive, and the measures that have been used in research assess a broad set of skills (i.e., literacy, language, math, social-emotional, attention, regulation), each of which itself is multidimensional and comprises numerous measures. Thus, it is not surprising that research finds inconsistent and weak associations between process quality and children's school readiness, given the heterogeneity of measures used across studies and a lack of precision in aligning specific measures of quality with the developmental outcomes that they are most likely to impact. A more constructive conclusion that has yet to be reached would be identifying the specific dimensions of process quality that are associated with specific school-readiness skills.

A related methodological limitation in these studies concerns the statistical reliability of the measures that have been used to assess both pre-K quality and school readiness. Reliability refers to error that arises when measuring a phenomenon of interest (Meyer, 2010), and there are multiple sources of error that may compromise the accuracy of measures of pre-K quality and school readiness. For example, pre-K process quality is typically assessed using observational measures in which multiple raters assess quality in multiple classrooms on multiple days. The resulting scores that are intended to reflect process quality of pre-K classrooms may include sources of error related to variation in scores across raters (i.e., inter-rater reliability), variation in scores across days (i.e., test–retest reliability), and variation in items that are intended to assess the same construct (i.e., internal consistency reliability).

Similarly, measuring school readiness typically occurs by direct assessment or teachers' reports of children's skills. During a direct assessment, 4-year-olds may have challenges attending to the demands, and the resulting scores may reflect both the construct of interest (e.g., literacy) and the state of the child during the assessment (e.g., attentiveness, focus, tiredness, hunger) which is independent of this construct. Pre-K teachers' reports of children using standardized rating scales are commonly used to assess their academic and social-emotional competencies (e.g., Gresham & Elliott, 1990; Hightower et al., 1986). However, scores from these ratings comprise information about the characteristics of the child, as well as the biases and perspectives of the teacher making the ratings about the child (Mashburn, Hamre, Downer, & Pianta, 2006; Mashburn & Henry, 2004). Low reliability in observational measures of pre-K quality and assessments of school readiness attributed to these sources of error compromises the validity of results from studies of the associations between pre-K quality and school readiness (Mashburn, Downer, Rivers, Brackett, & Martinez, 2013; Raudenbush & Sadoff, 2008). Future research would be strengthened by adopting data collection procedures that minimize these sources of error, thereby increasing the precision of the estimated associations between pre-K quality and school readiness.

Another methodological limitation of prior studies investigating links between pre-K process quality and school readiness concerns possible selection biases. Selection bias in this case refers to systematic differences between children who enroll in low- and high-quality pre-K programs that may affect their subsequent school readiness (Heckman, 1979). For example, children from relatively more privileged families may have greater resources at home that directly affect their development and parents who are more likely to find and enroll their child in a higher quality pre-K program. These children receive the benefits of higher quality pre-K and more resourced and supportive home environments, making it difficult to disentangle the unique contributions of pre-K quality to development. As a result, studies that do not fully account for characteristics of the home that give these children developmental advantages may overestimate the impacts on school readiness that are attributed to higher quality pre-K.

The opposite selection dynamic may also be true. Children from more economically disadvantaged homes may be placed into higher quality programs that receive greater resources and support in order to improve the developmental outcomes of children who have the greatest needs. These children may otherwise be on course for lower school readiness relative to

their more advantaged peers; however, their higher quality experiences in pre-K may reduce or eliminate the achievement gap at school entry. In this case, the effect of pre-K quality on school readiness may be underestimated, if it does not adequately account for differences in home and family characteristics of children who enroll in high- and low-quality programs. Future research on the associations between pre-K quality and school readiness must investigate the child characteristics that relate to the quality of pre-K experiences, and eliminate any selection biases that may affect estimates—upwards or downwards—of the associations between pre-K quality and school readiness.

A final methodological limitation present in most studies of pre-K process quality and children's school readiness is the assumption that this association is linear. In other words, the statistical tests assume that the magnitude of the association between pre-K quality and school readiness skills is equal across all points on the quality-rating scale. However, it may be the case that the associations are nonlinear, such that the increases in quality have greater impacts on school readiness within particular ranges of quality. Recent "threshold" analyses have been conducted in which the associations between quality and school readiness are compared at points below and above a specific point on the quality rating scale (Burchinal, Kainz, & Cai, 2011; Zaslow et al., 2010). For example, Burchinal, Vandergrift, Pianta, and Mashburn (2010) identified cut-off points for the measures of Emotional Support and Instructional Support on the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008). Classrooms were separated into two groups according to this cut-point—lower quality and higher quality—and analyses tested whether the effects of quality on children's development were stronger within the lower quality or higher quality classrooms. Interestingly, results showed that the associations between quality and children's development were significantly stronger among the higher quality group than the lower quality group. These results question the assumption that the quality to outcome association is linear, and they help to identify the minimum "dose" of quality required before positive outcomes for children can be achieved (Zaslow et al., 2010).

In addition to the above-noted methodological limitations in research on high-quality pre-K and school readiness, there are two conceptual problems within some of these studies. First, many studies examine the extent to which pre-K quality affects children's development without considering whether the associations are stronger for certain subgroups of children. There are two hypotheses about potential "moderating" effects of pre-K

quality. The first is that higher quality pre-K has a relatively stronger effect on development for children who experience greater social and economic risks, suggesting that higher quality buffers these children from the negative effects of the disadvantages they experience at home. Some studies examining the differential effects of quality find evidence that higher quality preschool environments do have stronger positive effects for children who experience social and economic risks related to race/ethnicity (Bryant, Peisner-Feinberg, & Clifford, 1993; Burchinal, Ramey, Reid, & Jaccard, 1995; Mashburn, 2008; Peisner-Feinberg & Burchinal, 1997), and other home and family risk factors (Baydar & Brooks-Gunn, 1991; Bryant et al., 1994; Caughey, DiPietro, & Strobino, 1994; Hagekull & Bohlin, 1995; Mashburn, 2008; Peisner-Feinberg & Burchinal, 1997).

An alternative hypothesis is that higher quality pre-K has a stronger positive effect on development for children from more privileged backgrounds. This result is indicative of a "Matthew Effect" (Stanovich, 1986), whereby early advantages grow larger over time, because more privileged children are better able to take advantage of the resources available to them compared to their less privileged peers. This hypothesis has also been confirmed in a few studies that found that children who experience *less* risky home environments benefit more from higher quality preschool environments compared to their peers who experience greater levels of risks in their homes (Belsky et al., 2005; Bryant et al., 1994; Early Head Start Research and Evaluation Project, 2002; Mashburn, Justice, Downer, & Pianta, 2009).

A second problem with the conceptual framework underlying research into the contributions of both structural quality and process quality on children's school readiness has been an implicit assumption that all measures of quality are *directly* associated with school readiness. The typical study involves measuring multiple dimensions of pre-K quality that are both proximal (e.g., learning materials, interactions with adults) and distal (e.g., class size, teachers' level of education) to the developing child, then testing the extent to which each has a significant association with children's learning and development. This presumption is an oversimplification of the mechanisms through which settings theoretically affect development. Specifically, it considers neither the differing contributions that proximal and distal features of pre-K settings have on development, nor the reciprocal nature of developmental processes whereby the developing child interacts with and affects the pre-K settings. The next section discusses the contributions of developmental theories in clarifying how high-quality pre-K promotes children's school readiness.

Contributions of Developmental Theories to Understanding Pre-K Quality and School Readiness

Despite the best efforts of research to empirically estimate the associations between pre-K quality and children's school readiness, the most accurate summary that can be distilled from these studies is that some measures of pre-K quality affect some dimensions of school readiness for some groups of children. This lack of clarity about the mechanisms through which attending pre-K impacts development is a major impediment to creating opportunities within pre-K settings that are aligned with children's developmental needs and promote their school readiness. Ecological theories of development (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006), when applied to pre-K, help differentiate the roles that structural quality and process quality have on children's development and offer some clarity into the theoretical associations between pre-K quality and children's school readiness that is not entirely evident from empirical studies.

Ecological systems theory (Bronfenbrenner, 1979) applied to 4-year-olds identifies multiple social settings within which young children live, actively participate, and have defined activities, relationships, and roles. These developmental contexts are termed microsystems, and for 4-year-olds attending pre-K, two primary ecological settings that shape the child's development are the home and the pre-K classroom. Development also is affected by the interactions and relationships between microsystems, referred to as mesosystems, which in this case involves the connectedness between family members and pre-K teachers, directors, and other staff (Serpell & Mashburn, 2012). Beyond the microsystems, children's development is also affected by exosystems, which are distal social systems within which the child does not play an active or direct role, but which may affect development nonetheless. In the case of children's development in pre-K settings, the child's exosystem comprises school and political systems that set policies and regulations for pre-K programs that can affect the child's experiences in pre-K. Finally, Bronfenbrenner (1979) identified even more distal inputs—national values, economic patterns, customs—that affect development, which are part of the macrosystem.

In their Bioecological Model of Development, Bronfenbrenner and Morris (2006) noted that the nuances of the original ecological systems theory were being lost in research. As was the case with prior studies of pre-K quality and school readiness, the broader field of developmental science was

also incorrectly testing the extent to which all ecological features directly affect development, no matter if the features were proximal or distal to the individual. In reaction, Bronfenbrenner and Morris (2006) added two propositions to the original framework of the ecological systems theory that help clarify the mechanisms through which pre-K structural quality and process quality impact development (Mashburn & Pianta, 2010).

The first proposition states that human development occurs through interactions between the individual and the persons, objects, or symbols in the individual's immediate external environment that occur on a regular basis, over extended periods of time, and increase in complexity. Applied to 4-year-olds in pre-K classrooms, this indicates that children's development of the skills they need to enter kindergarten ready to learn is the direct result of their interactions with teachers, peers, and learning materials. Specifically, children need frequent and sustained social interactions with adults and classmates that are supportive of their emotional needs and that are characterized by rich language and instruction that is appropriate to their ability level. Children also need frequent access to learning materials that sustain their attention, are appropriate for their ability, and become increasingly complex to offer continued opportunities for the child to develop. In sum, this proposition identifies process quality—defined more specifically as social and physical resources within pre-K classrooms that are appropriate to the child's ability, gain in complexity, and are regularly available for sustained periods—as the direct mechanism through which pre-K impacts children's development.

The second proposition from the Bioecological Model of Development (Bronfenbrenner & Morris, 2006) states that the impacts on development caused by the interactions between the individual and the other persons, objects, or symbols in the microsystem vary systematically as a function of the person and the environment (Bronfenbrenner & Morris, 2006). In other words, the associations between pre-K process quality (as defined in the first proposition) and school readiness may be magnified or reduced depending upon characteristics of the developing child and other characteristics of the pre-K environment. The first part of this proposition is consistent with empirical studies that found differential associations between pre-K process quality and children's school readiness related to children's social and economic background (e.g., Belsky et al., 2005; Bryant et al., 1994; Mashburn, 2008; Peisner-Feinberg & Burchinal, 1997).

The second part of this proposition identifies the role that structural quality plays in promoting children's school readiness. Specifically, structural

features of pre-K programs, such as class size, child-to-teacher ratio, and curriculum type, are instituted through policies, alter the pre-K environment, and affect children's development indirectly in one of two ways. First, small class sizes, lower child-to-teacher ratio, and a comprehensive curriculum may be conditions that magnify the effects that the social and physical resources in the classroom have on children's development. For example, a teacher's use of instructionally rich language may have a stronger impact on children's language development in classrooms with smaller class sizes and lower child-to-teacher ratio, because the teacher has greater opportunities to engage in direct dialogue with the child. In addition, the quality of the physical learning materials in a classroom may have a stronger impact on children's academic development when paired with a curriculum that supports children's use of these materials in more appropriate ways.

Structural features of pre-K settings such as class size, child-to-teacher ratio, teacher education, and field of study may also indirectly affect children's development in another way. Each of these features may improve the quality of interactions that children experience in classrooms, which in turn affects children's development. Thus, these dimensions of structural quality have a mediated effect on development; they affect children's school readiness if they improve process quality. In sum, the Bioecological Model of Development (Bronfenbrenner & Morris, 2006) indicates that the features of pre-K settings that have the greatest impacts on children's school readiness are the physical and social resources within the classroom that the child directly experiences, are available on a regular basis, are aligned with the child's ability, and become increasingly complex to meet the child's changing needs. Structural features of programs are part of the exosystem, distal to the developing child, and affect children's development indirectly to the extent that they improve the quality of the classroom processes or create environmental conditions that magnify the effects of these processes on development.

In addition to these ecologically focused theories of development, person-focused theories that explain the processes by which individuals acquire knowledge also have implications for the opportunities and experiences that young children need in pre-K settings to promote their school readiness. Specifically, seminal theories of cognitive development by Piaget (1952) and Vygotsky (1963) identify the active role that children take in constructing knowledge. This process begins through frequent opportunities for children to freely explore their environments and engage in activities with learning materials and other individuals that challenge their current knowledge of

the world. It is amid these challenges that the possibility of learning and development is presented; and learning and development is achieved when the child receives new knowledge from the social and physical resources in the classroom that resolve the challenges. Thus, a more precise definition of high-quality pre-K is a setting that facilitates this process in which children successfully construct new knowledge.

More specifically, a high-quality pre-K setting is one that: offers frequent opportunities for the child to explore, engage with, and be challenged by learning materials, peers, and adults in the pre-K environment; recognizes when the child is amid a challenge; and responds to the child's challenge in a way that extends their current knowledge to a higher level that is within their potential. Effective extensions of knowledge by teachers amid a child's times of challenge are characterized by open-ended questions, back and forth conversations, follow-up questions, hints, clues, expansions, repetition, integration, clarification, encouragement, and affirmation (Hamre, Pianta, Mashburn, & Downer, 2007). Despite the overwhelming task that pre-K teachers face in facilitating this process of learning to children on a regular basis throughout the school year, it is precisely these types of experiences in pre-K classrooms that cause children to develop the competencies they need to enter school ready to learn.

Conclusions

Empirical research about the associations between pre-K quality and children's school readiness has failed to identify the specific features of pre-K settings that affect specific dimensions of school readiness, and for whom. This is due, in part, to notable limitations in the study methods and problems with the conceptual framework guiding these studies. The resulting lack of clarity about the inputs to, and processes within, pre-K settings that improve school readiness has led to disagreements about how to structure and implement pre-K in ways that will increase its impacts on children's school readiness. Ecological and person-focused theories of development applied to 4-year-olds in pre-K settings offer insights into the key features of, and experiences in, pre-K settings that align with children's developmental needs.

Specifically, developmental theories posit the following. Structural features of pre-K programs are distal to the developing child, and they have the potential to indirectly impact children's school readiness to the extent that

they improve the quality of the classroom processes or create environmental conditions that magnify the effects of these processes on development. Children's daily interactions with the physical resources and social resources in classrooms have the potential to directly impact development. The process of learning and development begins through regular and sustained opportunities for children to engage in activities with learning materials, teachers, and peers that challenge their current knowledge about the world. Learning results from a response that provides new information to the child that resolves this challenge.

From this perspective, a high-quality pre-K program is defined as one that is rich with opportunities for children to engage in this process of learning. It is characterized by social interactions that promote challenges through questions and clues, extend challenges through expansions and clarifications, resolve challenges through clarification and repetition, and support the child throughout this process with encouragement and affirmation. These are the mechanisms through which attending pre-K will promote children's school readiness skills, and definitions of high-quality pre-K program should be narrowed to include only these key features. Program improvement efforts that are organized around improving quality defined in this way have the greatest likelihood of promoting children's school readiness skills and long-term success.

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14

Consistent Environmental Stimulation from Birth to Elementary School

The Combined Contribution of Different Settings on School Achievement

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This chapter starts with the premise that children's school-readiness skills and capacities are fostered through everyday interactions and relationships with adults across the settings they experience in the years prior to school. As they grow from birth, children engage in increasingly elaborated and symbolically mediated interactions with caregivers (parents and teachers) in which emotion, cognition, behavior, and communication are intertwined and organized. Out of this exceptionally complex, dynamic, multisystem process emerges the capacity, skill, and interest to read, understand, and produce written language, to self-regulate, to engage in academic activities, and to acquire knowledge of the world (Clements & Sarama, 2008; Dickinson & Tabors, 2001; Foorman & Torgesen, 2001). School readiness, which could be viewed as a "behavioral system" in much the way Bowlby (1969/1982) viewed attachment as a behavioral system, recruits and organizes many processes, among which are: interactions at home, in child care, and school with people that provide foundations for learning and self-regulation; the understanding and production of oral language; the capacity for short-term memory and attention; and even sensitivity to the properties

of print and sounds (Dickinson, Anastapolous, McCabe, Peisner-Feinberg, & Poe, 2003; Lonigan, Burgess, & Anthony, 2000; Morrison, Bachman, & Connor, 2003). From a developmental perspective, it is within the context of adult–child relationships that these processes are stimulated and become organized as a system of behaviors serving the functional goals that are observed and assessed as school-readiness skills. The following discussion focuses on the role of relationships in the development of school-readiness skills, and the consequences of this perspective for research and theory, with an emphasis on literacy and language development because of their prominence as gateway capacities in early school functioning.

Relationships, Interactions, and Development of School-Readiness Skills

Children's early school experiences are a matter of national concern, as evidence consistently points to the significance of early achievement in predicting future educational accomplishments. Although two thirds of America's first-time kindergartners a decade ago entered school proficient in the recognition of letters (West, Denton, & Germino-Hauksen, 2000), this is perhaps a deceptively bright picture of current affairs. Moreover, then and now, children's preacademic skills upon entry into school vary consistently as a function of multiple risk factors (e.g., family poverty, race/ethnicity; Denton & West, 2002), and concerns about very large learning and performance gaps among groups is growing (Pianta, Barnett, Burchinal, & Thornburg, 2009).

Increasingly, early childhood is viewed as a sensitive period for the development of key cognitive, literacy, and language competencies—skills shaped by child characteristics and family, child care, and early classroom experiences (Morrison & Connor, 2002; NICHD ECCRN, 2002a). Pathways for later educational success or difficulty are formed during young children's early adjustment to school (Entwisle & Hayduk, 1988; Hamre & Pianta, 2001). Prekindergarten cognitive skills and math and reading achievement during first through third grade tend to be maintained into early and late adolescence (e.g., Vandell et al., 2010), although there is clear evidence that stability is only moderate in the early grades (La Paro & Pianta, 2000). In addition, early academic problems place children at risk for grade retention and school dropout (Vandell et al., 2010). Because apparently few

opportunities occur after third grade to alter an academic development trajectory, understanding the factors that shape the early phases of achievement trajectory, during the preschool to primary grade period, has implications for early mobilization of educational resources. These resources could then be targeted based on findings about the relative influence of child, family, child-care, and classroom factors on children's cognitive skills and academic achievement. Weighing the relative contribution of early and concurrent experiences also provides a context for interpreting the effectiveness of school-based programs that seek to raise achievement.

Children's early experience within their family and aspects of family structure are consistently strong predictors of preacademic skills, as well as later academic achievement and cognitive functioning (McWayne, Hampton, Fantuzzo, Cohen, & Sekino, 2004; Morrison & Connor, 2002). Maternal education and family income are key elements of family structure that have been associated with young children's academic outcomes, language development, and cognitive abilities (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Duncan & Murnane, 2011; Vandell et al., 2010). In addition, aspects of the parent–child relationship, in particular maternal sensitivity during parent–child play interactions, are especially robust predictors of children's academic competence in kindergarten and first grade, even after accounting for factors such as maternal education (NICHD ECCRN, 2006; Vandell et al., 2010). Relatedly, a stimulating home environment is another well-established element of the family associated with young children's academic and cognitive development (Bradley, Corwyn, Burchinal, McAdoo, & Coll, 2001). There is general consensus that early family context—and, in particular, parenting quality and the stimulation of language skills—tends to make a stronger contribution to children's development than other early childhood contexts (NICHD ECCRN & Duncan, 2003).

Early child-care experiences, particularly high-quality care, also appear to enhance children's development of language and academic skills prior to school entry (Burchinal et al., 2002; Vandell et al., 2010), even above and beyond the effects of the family environment as a "value-added" factor (NICHD ECCRN & Duncan, 2003). Across several naturalistic, longitudinal projects, including the Cost, Quality, and Outcomes Study, NICHD Study of Early Child Care, and the Multi-State Study of Prekindergarten, findings consistently demonstrate that quality experiences in a child-care context predict language, cognitive, and achievement outcomes after controlling for family selection factors such as socioeconomic status and parental sensitivity (Vandell et al., 2010; Peisner-Feinberg et al., 2001). Definitive

evidence from quasi-experimental and experimental studies with samples of children who experience social and economic risks further indicates a positive effect of comprehensive, high-quality early child care on children's cognitive ability and academic success in elementary school through adolescence (see Pianta et al., 2009). Effects of the most thorough and concentrated of these early child-care interventions are reported to have been sustained into early adulthood, leading to positive academic achievement and increased rates of employment (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002).

In sum, experiences with adults in homes, child care, preschool, and the early grades of school are formative assets for the development of skills that translate into success in elementary school and beyond. Understanding and ultimately strengthening the role and impact of these experiences, particularly as transmitted in relationships and interactions, is addressed in the sections to follow.

Interactions with Contexts: Relationships and Distributed Competence

One of the most common ways in which relationships and interactions have been a focus in research on early literacy and language development has been in studies of joint storybook reading by mothers/teachers and children (deJong & Leseman, 2001; Zevenbergen & Whitehurst, 2003). Yet relationships with adults play a much broader and long-standing role in literacy development and school readiness than simply being a setting for book reading. Relationships support literacy, cognitive development, self-regulation, and ultimately early achievement by providing language stimulation and conversation, co-regulation of attention, arousal, interest, and emotional experience, direct transmission of phonological information and content, and engagement in the understanding of language that fosters cultural understanding (Baker, Mackler, Sonnenschein, & Serpell, 2001; Dickinson & Tabors, 2001; Whitehurst & Lonigan, 1998). In relationships and interactions with adults, experience supporting school readiness occurs at multiple levels and across multiple domains, engaging and activating motivational and belief systems that produce interest in printed words that hold meaning and information, as well as cognitive, linguistic, and attentional mechanisms (e.g., Dickinson et al., 2003).

A young child's capacity to engage in a book-reading task, a puzzle, or to playfully explore a learning opportunity is dependent on skills that are embedded in his or her experiences and interactions with personal and material resources in a variety of settings: with adults and peers at home, in child care, or in school. From a developmental systems perspective, children's interactions with these settings are active and dynamic exchanges of information, material, and energy (Ford & Ford, 1987). Developmental process and growth, particularly in infancy and early childhood, is so dependent on these interactions, that it is possible to view the developing child as having permeable "boundaries" such that competencies that appear to reside in the child are actually *distributed* across the child and the resources (personal and material) they engage within these various settings (Hofer, 1994; Resnick, 1994). Given this point of view, it is not surprising to find that the most powerful and ubiquitous predictor of young children's functioning on skills related to social and academic competence as they enter school is the quality of interactions observed between mother and child during the preschool period (NICHD ECCRN, 2006; Storch & Whitehurst, 2001). For example, literacy behaviors displayed by children, even those at the level of skills involved in processing phoneme–grapheme associations, are embedded in these interactions and organized within adult–child relationships (Pianta, Hamre, & Stuhlman, 2003).

Most comprehensive views of the development of school readiness recognize the central role and function of child–adult relationships, as evinced by the scores of articles on parent–child storybook reading, child–teacher interactions and instructional practices in child care preschool and in elementary-school settings, and intervention approaches that target parent–child interactions. Relationships between children and adults are a central, and most likely *necessary*, conduit for energy and information that fuel developmental change in the capacities that ultimately take form in school readiness.

Relationships, Interactions, and School Readiness: Birth to Elementary School

Most considerations of adult–child relationships and school readiness focus on literacy and language as the medium of interaction and/or limit the time frame to the toddler or preschool age and older; this is particularly true

when the role of the adult is defined as a teacher/educator. A more comprehensive view of how adult–child relationships function to support literacy competence starts in early infancy and moves through the preschool early elementary period, involving systems other than language or phonological processing. This argument and its implications are outlined below.

In his theory of development and the formative role of parent–child relationships, Sroufe (1996) describes the developmental themes around which interactions between children and caregiving adults (parents, child-care providers, teachers) are organized over time. Pianta (2003) extends this perspective by aligning these relational themes and processes with phases and processes in literacy development with a specific focus on the role of teachers. In considering the role of teacher–child relationships in literacy acquisition, two key starting points are: (a) the recognition that the school-readiness behavioral system recruits skills and processes that begin in infancy (Dickinson & Tabors, 2001; Lyon, 2002) and (b) the teacher–child interactions and transactions that take place around specific school-readiness skills and processes (such as sensitive stimulation of oral language) also support other readiness outcomes, such as social competence and self-regulation, some of which, in turn, also support literacy skills. When discussing the role of teacher–child relationships in the development of school readiness, the multilevel, reciprocal, dynamic nature of development is clearly both a challenge and an opportunity for deeper understanding.

Developmental progress in the increasing organization and complexity of relationships between children and adults can be characterized according to a set of relational themes described by Sroufe (1996). These adult–child relationship themes include: (a) regulation and modulation of physiological arousal, (b) formation of an effective attachment relationship, and (c) self-reliance and the organization and coordination of environmental and personal resources. The relational processes embedded in these themes, starting in infancy, are platforms and mechanisms that support activities such as dialogic reading, playing rhyming games, storybook reading, or learning vocabulary or letter names. For example, if a mother fails to respond sensitively and responsively to the infant's interactive cues during feeding situations at 6 months, the ensuing problems with interacting cooperatively undermine the value of storybook reading or interactive rhyming games for supporting emergent literacy skills when the child is 2 or 3 (e.g., Bus & van IJzendoorn, 1995). These relational themes, and the developmental progression that characterizes the infancy–elementary period, are described

below, with attention to the specific ways in which these themes contribute to literacy.

Infancy and Toddlerhood: Parents and Care Providers as Teachers

Infancy is a period of intense development as infants learn how to interact with the world based on their primary relationships. Rapid changes in physiological and social development during infancy allow for important teachable moments through interactions with adults (Crockenberg & Leerkes, 2005). Infants learn most of the skills they will need to navigate the world through interactions with their environment. First relationships are typically established with a parent or primary care provider. However, as infants enter day-care settings, important relationships are established with caregiving adults. These relationships foster social and emotional development and shape self-perception and self-regulation. Positive interactions between infants and adults can lead to healthy intellectual and social development (Nelson & Bosquet, 2005). The relationships between caregivers and infants in child-care settings serve as important mechanisms for learning about the world and developing social and emotional competence. Relationships built through positive interactions between infants and caregivers can shape the development of essential school-readiness skills such as inhibition, working memory, and cognitive flexibility (Thompson, 2009) and stimulate curiosity, exploration, and communicative intent (Raikes & Edwards, 2009). These interactions include physical connections as well as back-and-forth exchanges between caregivers and infants. Young children who are securely attached to their teachers are more likely to explore their environment, exhibit higher levels of play, and develop a sense of independence or autonomy (Gonzalez-Mena & Widmeyer-Eyer, 2007).

Regulation of arousal.
In the first 6 months of life, adult–child relationships and interactions are organized primarily around a theme of establishing and maintaining regulation and modulation of physiological arousal and joint attention. In these months the infant (and adult) must tolerate increasingly complex physical and social stimulation and maintain an organized state in the face of this increasing complexity. When established during episodes of interaction, this dyadic state supports periods of joint attention and mutuality, which, in turn, form the basis of exploration of the object and interpersonal world. Cycles driven primarily by the infant's physiological needs: sleep

and alertness, feeding, interest, and arousal, all begin to become organized within the interactions the infant has with the caregiver very early on within this period (Hofer, 1994; Sroufe, 1996). Because the infant is not capable of establishing and maintaining organized states in response to cyclic physiologic, arousal, and state variations on her own, interactions with a caregiver are *required* (Hofer, 1994).

When the dyad is functioning well, the infant responds to routines set by caregivers and, with caregivers, establishes regular rhythms of feeding, activity/alertness, and sleep in the context of smooth, regular, and predictable caregiving interactions marked by contingency upon infant cues. Over time, these fairly basic interactive patterns focused on physiological variation broaden to include domains such as interactive play (e.g., peek-a-boo games) and form a relational matrix that organizes the infant in the face of increasingly complex stimulation. This lays the foundation for processes related to communicative intent, function, and skill, key aspects of language that lay the groundwork for the early stages of reading (Dickinson & Tabors, 2001; Hart & Risley, 1992; Morrison et al., 2003), as well as for emotional development, self-regulation, and attention control. On the other hand, disordered child–caregiver interactions disrupt the ways that adult–child interactions transmit knowledge and skill to children and affect literacy-specific interactions such as those that occur during bookreading (Bus & van IJzendoorn, 1999). At later ages, well-regulated and contingent (e.g., sensitive, responsive) interactions between children and teachers in early elementary classrooms have been shown to predict improved growth in literacy, vocabulary, and social skills in prekindergarten (Howes et al., 2008) and first-grade classrooms (Connor, Son, Hindman, & Morrison, 2005), particularly for children who already show problems in self-regulation (Hamre & Pianta, 2005).

Developmentally, this early phase of adult–child relationships has marked consequences for school readiness and can be easily underestimated, which has particularly negative consequences for understanding and responding to the needs of children who are struggling academically or behaviorally and socially in subsequent years (Dickinson, St. Pierre, & Pettengill, 2004). For example, to the extent that the vast majority of language development supporting later literacy occurs within the home setting between birth and 3 years of age, is fairly stable through the preschool and early elementary years (e.g., Dickinson & Tabor, 2001; Sparling, 2004), and is predicated on these early interactive rhythms, communicative styles, and skills, then attempts to enhance literacy for underachieving children can only be strengthened

by attention to the earliest patterns of dyadic regulation. Difficulties in establishing shared attention and engagement predict problems in behavioral and emotional regulation that have consequences for the level of enjoyment and motivation for engagement in joint book reading or a range of other learning-related interactions that take place later in toddlerhood and the preschool years. The quality of these early child–adult interactions affect whether the child will be a willing or skilled partner with parents or teachers in activities in which language and communication are involved in the transmission of knowledge and skill (Foorman & Torgesen, 2001; Zevenbergen & Whitehurst, 2003).

Attachment.
The next relational theme, emerging toward the end of the first year of life and continuing throughout childhood, involves the formation and maintenance of an effective attachment relationship. Effective attachment to an adult affords the child a sense of emotional security in the context of a relationship and provides the basis for early exploration of the object and interpersonal world (Howes & Ritchie, 2002). Attachment processes regulate emotions and behaviors when the child feels threatened and are critically important for the infant beginning to explore (Sroufe, 1996). Attachment processes recruit mechanisms related to attention, motor behavior, fear and wariness, and signaling systems between the caregiver and child. Adult responsiveness, emotional availability, and an effective signaling system are key aspects of determining the nature and quality of how these behaviors and processes are organized as are the adult's previous attachment experiences (Zeanah et al., 1993).

The link between attachment and exploration advances cognitive skill through enabling efficient and active exploration of, and attention to, information in the environment. This is often called the "secure-base" function of attachment, by which the adult–child relationship serves as a conduit to information. Whether a relationship functions as a secure base for exploration is related to the child's sense of emotional (and physical) safety and security, the effectiveness, depth, and complexity of communication and emotional expression between adult and child, and the adult's skilled integration of new information into ongoing interactive sequences. One can easily see the linkage between secure-base processes and language development and communicative skills.

With regard to the areas of school readiness related to literacy skills and language development, secure attachment predicts language complexity,

emergent literacy and reading, aspects of cognition, and social interaction with peers and other adults (see Sroufe, 1996). It figures prominently in the joint book-reading interactions of parents and children; children with secure attachments to an adult display more positive emotions during joint storybook-reading interactions and engage in more extended discussions of the book (Bus, Belsky, van IJzendoorn, & Crnic, 1997), while those with insecure attachments are less attentive and engaged (Bus & van IJzendoorn, 1997), thus less able to make use of the value of these book-reading sessions.

Toddlerhood—interactions and autonomy.
Toddlerhood is a period of rapid development for young children, with major skill acquisition and growth across the developmental domains that collectively foster a sense of autonomy and mastery. The skills acquired and the sense of self that emerges in this phase remain closely linked to experiences with adults and provide important precursors to skills required to adjust to and engage in elementary classrooms. For example, in this period children move from crawling to walking, running, and jumping; they change from being primarily recipients of language to having the potential to express more than 900 words. Toddlers are grappling with exerting emerging independence as they are beginning to understand rules and limits and balancing their independence with their need for security and comfort from adults (Calkins, 2007; Sroufe, 1996). Toddlers are in a developmental phase heightened by factors such as their emerging capacity for regulation of their physiological and emotional arousal; the demands of compliance with adult directives, and challenges in formal group settings that often require children to end a pleasurable activity and begin something less desirable (e.g., the transition from playing with toys to putting the toys back on the shelves or from running around chasing peers to a more stationary activity). In addition, conflict often arises for toddlers in early care and education settings because they and their peers explore social relations and the variety of opportunities and challenges presented in exploring people, materials, and activities. The unique developmental characteristics of toddlers to have "autonomy with connectedness" (Sroufe, 1996, p. 620) increase the importance of the emotional and behavioral support in toddler child-care settings.

Relationships with adults in their environment help guide and foster toddlers' development and independence; for toddlers, these relationships provide the context for development (Thompson, 2006). Children's experiences and success in classrooms are optimized when the teacher monitors

children's behavior, sets clear expectations, uses positive phrasing in re-direction, and consistently provides children with activities and materials (Bredekamp & Copple, 2008; Feldman & Klein, 2003). Positive emotional and behavioral support in toddler classrooms is important for children to feel secure enough to form relationships with their teachers. For positive early social and behavioral development, toddlers need warm and consistent interactions with the adults in their environment.

A large proportion of children enter child care as toddlers, and have opportunities to develop an attachment with teachers in these settings (Calkins, 2007; Gianino & Tronick, 1988; Raver, 2004) as well as advance in behavioral regulation (Calkins & Johnson, 1998; Da Ros & Kovach, 1998; Eisenberg et al., 1997). Children with secure attachments to a teacher tend to explore their environment more fully, try new things, exhibit higher levels of play, and develop a sense of independence or autonomy (Gonzalez-Mena & Widmeyer Eyer, 2007). Toddlers' relationships with teachers and caregivers provide them with a secure base from which to explore all facets of their world, and these emotional bonds play a prominent role in toddlers' language and cognitive development.

These early relationships with teachers also foster cooperation and behavioral regulation. The term "behavioral regulation" (Calkins, 2007) generally refers to children's abilities to control impulsive behavior and comply with external requests. Relatedly, the acquisition of these standards of conduct allows children to function successfully in school environments and with peers (Calkins, 2007). Hence, the relationships developed and sustained for toddlers in child care contribute to their development and learning in significant ways. The back-and-forth exchange of information provides the foundation for learning and development and language development during the toddler period (Hendriks-Jansen, 1996). These interactions not only advance children's thinking, reasoning, and verbal skills, they also impart knowledge about the world as well as capacities such as persistence, attention, and motivation. Cognition and language development are closely related; although adults can label and "teach" words to young children, a child's "ability to infer referential intentions of others" (Katz & Snow, 2000, p. 84) refers to the child's ability to understand an adult's intention. However, the adults' interactional behaviors of pointing and engaging set up the context for children to begin to make inferences (Nelson, 2007). The properties of the interactive exchanges between teachers and children — the information conveyed, feedback loops, and conversational sequences — are critical to teachers' fostering of children's learning.

Preschool and Early Childhood: Parents at Home and Teachers in Schools

The ability to maintain caring and supportive relationships with students is crucial for all teachers of young students (Pianta, 1999). Sensitive teachers and teachers that create a positive climate in their classrooms tend to be more familiar with the academic needs of their individual students (Helmke & Schrader, 1988). These features of teacher–child interactions collectively, and separately, predict students' performance on standardized tests of literacy skills in pre-K, and grade 1 (Mashburn et al., 2008; NICHD ECCRN & Duncan, 2003); lower levels of mother-reported internalizing behaviors in kindergarten and first grade (NICHD ECCRN, 2003); and students' engagement in the classroom across all grade levels (Bryant et al., 2002; NICHD ECCRN 2002b, 2003). Although these processes are important for all students, they may be particularly important for students at risk of school failure. For example, among a group of students who displayed significant behavioral and emotional problems in kindergarten, those who were placed in first-grade classrooms offering high levels of emotional support made academic progress at levels similar to their low-risk peers, while students at risk placed in classrooms offering lower levels of emotional support fell further behind their low-risk peers (Hamre & Pianta, 2005). Importantly, these studies demonstrate that these aspects of classroom experience *uniquely predict* student outcomes, adjusting for selection effects and prior student functioning.

Home and preschool settings in which *behavior*, *time*, and *attention* are well regulated through interactions with adults foster more positive gains on a range of school-readiness outcomes (Cameron, Connor, & Morrison, 2005). These settings function best and children have the most opportunities to learn when their behavior is within a range of tolerance, they consistently have things to do, and they are interested and engaged in learning tasks (Pianta et al., 2003). Research on the importance of *time* management, provides consistent evidence that when children are engaged, this is directly associated with learning. A recent study suggests that effective classroom managers spend more time on management activities at the beginning of the school year and that this early investment in management pays off for students and teachers by enabling them to spend less time in transition and more time in child-managed activities over the course of the school year (Cameron et al., 2005). Finally, for students to learn they must not only have something to do, but they must be effectively engaged and interested

in the instructional activities provided to them (Yair, 2000). Consistent with constructivist theories that guide much of early childhood practice (Bruner, 1996; Rogoff, 1990; Vygotsky, 1979), when teachers provide activities in which there are multiple pathways for engagement, students are not just *passively* engaged in learning, but are *active* participants in it. Taken together, these dimensions of classroom management set the stage for learning in preschool to third-grade classrooms.

Functional self-reliance.
Starting in the toddler/preschool years and continuing throughout childhood, a key theme of child–adult interaction is the child's functional self-reliance and coordination of personal and environmental resources in the context of relationships with adults. This theme, in fact, dominates interactions and relationships between children and teachers for most of a child's school career (Pianta, 1999). The child's use of her own and others' resources to engage information and tasks available to her to meet social and task-related demands is the hallmark of self-reliance, evident when the child enthusiastically engages problems in the world, persists in using her own efforts to address the problem, and, before disengaging, signals for and uses resources from others (Pianta, 1999). In this period, increasingly explicit literacy-related activities and interactions— listening to and telling stories, engaging in conversations, participating in and attending to joint storybook reading, playing games with words and songs, and even starting to learn letters—are a frequent focus of adult–child interactions at home (e.g., Storch & Whitehurst, 2001) and in child-care/preschool/school settings (Dickinson et al., 2004). In fact, by age 3–4 most children are enrolled in a preschool or other early education setting and interactions with parents at home and teachers in those settings are increasingly focused on transmitting literacy skills.

A teacher and child looking at or reading a storybook together one-on-one or in a small group in one of the main settings of literacy-supporting interaction is one of the most common learning activities, which starts in toddlerhood and extends into early childhood. Children's motivation to engage in interactions teaching reading-related skills, such as learning letter names and playing rhyming games, is cultivated through joint storybook reading, because through storybook reading they learn that understanding print is a tool for enjoyment and for learning. Storybook interactions also convey information about how oral and print forms of communication are integrated (Dickinson & Tabors, 2001), particularly when teachers call

attention to connections that provide cues to unlocking the phonetic code (Whitehurst et al., 1994). The child's willingness to explore and practice these abstract forms of language and cognition and engage in the more instructionally focused interactions that they require is a consequence of the child's relationships experience with regard to prior relational themes of attachment and secure-base functioning.

A child's emotional experience in relationship with a teacher can be a key feature influencing the nature and extent of learning in early childhood. When the child experiences security, interactions are cooperative and responsive, reading together occurs more frequently (Bus & van IJzendoorn, 1995), is more enjoyable and rewarding, and more information is transmitted through instructional sequences. It is not at all controversial to suggest that teachers' emotional sensitivity and a child's sense of security are important elements of early childhood learning environments.

However, emotional security and sensitive responsiveness during this period, although perhaps *necessary* for establishing relationship-level functioning that supports ongoing enjoyment of reading and engagement in communication and language-focused activities, are not *sufficient* for competence in a young learner (Baker et al., 2001; de Jong & Leseman, 2001; Foorman & Torgesen, 2001). For example, being emotionally warm as a teacher probably is not enough if children are to acquire competence in decoding print, particularly for children whose prior experiences have been understimulating of language- and literacy-related processes. This is because the complex and multicomponent processes involved in knowledge and mastery of receptive and expressive forms of print–sound correspondence, particularly at the level of phonemes, *requires explicit instruction from a teacher*, whether in the home or at school (Burgess, Hecht, & Lonigan, 2002; Foorman & Torgesen, 2001; Lyon, 2002; Morrison et al., 2003). Cleaving the instructional and emotional dimensions of teacher–child relationships is a somewhat unfortunate by-product of the differential attention these aspects of teaching have received over the years. From a relationship-systems perspective, emotionally sensitive interaction and appropriately stimulating instruction co-occur in adult–child relationships that are bestsuited for supporting children's skills: these aspects of interaction are not mutually exclusive in skilled teachers or parents (Pianta et al., 2003). In one specific example of this in prekindergarten classrooms, emotional and instructional quality both contribute to growth in literacy skills, vocabulary, and social skills (Howes et al., 2008).

As just one example, the intentionally instructional component of teacher–child literacy-focused interaction, in which the adult provides cues to phoneme–grapheme relations and elicits the child's performance and practicing of these relations, has been shown to be the mechanism by which the child learns decoding skills that enable him or her to read text independently and ultimately to understand print (e.g., Foorman & Torgesen, 2001; Storch & Whitehurst, 2001). It is apparent now that such skills are taught, hopefully in the context of emotionally warm and sensitive teacher–child relationships. At the phase of literacy development when learning decoding skills is critical, teacher–child interactions with print that once served social, communicative, and meaning-focused functions, must become integrated with instructional elements that have the acquisition of skills related to phoneme–grapheme associations as their goal. In preschool, and certainly by the elementary years, the extent to which the explicitly skill-focused instructional dimension of interaction appears necessary for later reading is related to a range of prior conditions, some of which involve the themes of adult–child interaction discussed above that predispose children for difficulty in learning to read.

The relationship transition that involves introduction of a skill-focused, instructional component to adult–child interactions in the context of their emotional side is perhaps the single most challenging aspect of adults' facilitation of children's growth in early academic skills considered important in school readiness. This transition is difficult because it requires a transformation and reorganization of the relationship from a primary focus on emotions and support to a focus on instruction in challenging skills. In early childhood, how teacher–child relationships integrate the intentionally *instructional* dimension of interaction with the ongoing *support* dimension and balance phonological skill-focused interaction and instruction with enjoyment/meaning-focused interactions is a challenge that may determine whether or not the child will competently read.

Available data suggest that the challenge of integrating these two forms of interaction—(a) motivational and meaning/communication-focused and (b) instructional and skill-focused—continues throughout early childhood, with increasing prominence of instruction in the early elementary school years (Baker et al., 2001; Whitehurst et al., 1994), particularly if children are having difficulty learning to acquire key readiness skills (Foorman & Torgesen, 2001). As noted above, this integration is an enormous challenge to teacher–child relationships. For example, nearly all teachers of reading from pre-K to third grade show enormous variation in the instructional

component of literacy-related interactions with children; yet, at the same time, their social and emotional interactions are less variable and on average fairly positive (Pianta, Belsky, Houts, Morrison, & NICHD ECCRN, 2007). This variation in the frequency, nature, and quality of teacher–child instructional interactions is evidence of the degree to which instruction challenges their relationships (e.g., NICHD ECCRN, 2002b; Whitehurst et al., 1994).

In short, teacher–child relationships have both support and instructional components that provide for the development of school readiness through competencies related to communication, self-regulation, attention, understanding, and eventually print–sound correspondence. These components of relationships and of readiness have interrelated developmental sequences and at the same time coexist in parallel in a dynamic tension. These dynamics at work are what are observed in readiness-related interactions between teacher and child in classroom lessons and at home at bedtime.

How We Think about Risk: Challenges to Interactions, Relationships, and School Readiness

Elliott and Hall (1997) provide a comprehensive definition of characteristics of children that place them at risk for a range of negative outcomes as they mature. They include "difficulty in using language fluently and effectively . . . inability to attend to and persevere with tasks and activities, lack of purposefulness, imagination . . . initiative, [and] 'normal' social and emotional maturity" (Elliott & Hall, 1997, p. 198). This framework is useful in many ways, particularly in that it highlights the many types of early "warning signs" of risk for difficulty adjusting to the school setting that are apparent in young children's behavior. The presence of any or all of these warning signs should alert parents, teachers, and other interventionists that steps need to be taken to ensure these children's healthy development.

A potential shortcoming of this definition of risk is that it focuses predominantly on child-centered characteristics such as language, attention, and social maturity. Although delays or difficulties in these areas certainly place children "at risk" as they make the transition to school, another way of thinking about factors that place children at risk is in terms of relationships: interaction patterns, quality of relationships, and how significant adults in children's lives perceive interactions and child behaviors all impact development. In fact, one could conceptualize characteristics typically considered to

reside within young children (such as language, attention, and social skills) as aspects of regulatory processes involving adult–child dyads. In this view, risk in children is better conceptualized in relational terms, and therefore assessments and interventions that purport to address risk would involve a significant relational component or focus.

Substantial evidence suggests that both caregiver–child and parent–child relationships are related to children's peer competence, relationships with future teachers, and cognitive development and function as regulators of development. If these relationships are nonoptimal in nature, they may be conceptualized as representing developmental risk factors. Conversely, if these relationships serve as health-promoting systems, they may mitigate the negative impact of other factors (including poverty and maternal depression) that are typically related to the risk of social, emotional, or academic problems (Pianta et al., 2009). The type of interactions that enable children to form close, positive relationships with parents are believed to be the same factors that facilitate this type of relationship with caregivers. Specifically, sensitivity to children's needs and providing emotional support to children are emphasized in the literature on both parent–child and caregiver–child relationship quality.

The cognitive and social characteristics of children at risk for negative outcomes around the time of school entry listed by Elliott and Hall (1997) are likely linked with the quality of children's relationships with salient adults such as mothers and child-care providers. As these individual and dyadic factors are so closely related, one might conclude that research and intervention could be equally well informed by conceptualizing risk in either child-focused or relationally focused terms. However, several benefits are gained by conceptualizing risk from a relational as opposed to an individual perspective. First, social interactions between children and significant adults in their lives represent the interface between the internal characteristics of a child and the characteristics of the environment in which the child exists (Farmer & Farmer, 2001). Thus, elements of risk may be most clearly manifested in the context of social interactions. In addition, it may be in the context of such relationships that potentially deleterious factors can be most effectively addressed (Farmer & Farmer, 2001). Conceptualizing risk as existing first in dyadic interactions and then manifesting within individual children also generates more intervention strategies. For example, if risk is conceptualized as occurring, at least in part, in the context of interpersonal interactions, then relationship-building strategies can be employed to address those aspects of risk in addition to efforts to address the aspects of risk that

are situated in an individual. Pairing relationship-oriented interventions with individual interventions is likely to be a more powerful method of promoting health because such strategies will both reduce demonstrated risk and build positive "buffers" against future risk in young children. Furthermore, according to developmental theory, problems observed in children are not failures of the child per se, but rather failures of the larger systems that provide the context for the child's development.

In short, recent efforts to focus on children's school readiness in the context of national and state policy, and in terms of program evaluation, call attention primarily to a set of skills and competencies (or lack thereof) more or less "located" in the child. Measuring and conceptualizing and even improving these skills have reified this sense that young children's competencies are in some sense independent of the environment and settings in which they have been developed and elicited. And to some extent that is true: reliable and valid assessment of young children's school-readiness skills and their precursors are widely used and should be important and thoughtful anchors of early education systems. However, it remains a parallel, and an equally if not more important consideration to measure, conceptualize, and improve school-readiness competencies through processes located in the interpersonal relationships between children and adults. Not only may this be the most effective way to address a child's difficulties acquiring developmental competencies at any given time, but such a relational or transactional approach to fostering skills may also increase the likelihood that the child will be able to successfully develop needed competencies in the future.

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Part 4
Stress and Family and Child Wellbeing

15

Poverty, Public Policy, and Children's Wellbeing

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Poverty among families with children has been a persistent problem in the United States since the 1950s, when data began to be available. Rates of poverty have fluctuated over the years, with a significant dip in the 1960s and early 1970s, but they rose in the 1990s and reached high levels again in 2009. Programs for early intervention and aid to education in the 1960s War on Poverty were created because policy makers recognized that children living in poverty face multiple disadvantages that accumulate over time. In this chapter, I discuss some of the research illuminating the impacts of poverty on children, and then turn to the safety-net programs designed to reduce poverty or alleviate its effects on children.

Definitions of Poverty

For purposes of public programs and policies, including eligibility for services and block grants, the United States uses a definition of poverty that was created in 1963; it was initially defined as annual pretax income lower than three times the cost of a minimally adequate diet. The poverty threshold depends on the number of people in the family and is adjusted annually for inflation, but it does not take into account regional variations in cost of living except in Alaska and Hawaii. In 2012, the threshold was $23,050 for a family of four, and $19,090 for a family consisting of a single parent with two children. Because the poverty definition has been widely criticized, efforts

to revise it to reflect contemporary patterns of expenditure and to include noncash income have been underway for many years (Citro & Michael, 1995), but the original definition continues to be the basis of public policy. Many public programs determine eligibility as a family income representing a given percentage of the poverty threshold. For example, children are eligible for free school lunches with family incomes lower than 133% of the threshold and for reduced price lunches with incomes less than 185%. A number of scholars use 200% of the poverty threshold, describing families between 100% and 200% of the threshold as "low-income" (e.g., Sawhill, 2003). In 2012, that would be $46,100 for a family of four.

Rates of Poverty among Children

Although child poverty rates in the United States have fluctuated over time, they remain stubbornly high, with the latest increase occurring during the 2008–2010 recession when 20.7% of all U.S. children lived in families defined as poor and 41.7% lived in families with low incomes. Poverty rates were higher for children ages 0–5 (24%), compared with 18% for older children (Forum on Child and Family Statistics, 2011). Approximately 9% of American children lived in "deep poverty," defined as family incomes less than half of the poverty threshold—the highest percentage since 1997. There are large discrepancies among families based on ethnic group and family structure: poverty rates among Black (36%) and Hispanic (33%) children were three times those of non-Hispanic White children (12%), and 44% of children with single mothers were poor compared to 11% of children in married-couple families (Forum on Child and Family Statistics, 2011).

Hardship

Defining poverty by cash income assumes that people with low incomes lack ways of meeting basic needs for food, shelter, and health. Surveys often question people about "hardship," how often they go without food, cannot pay rent or have been evicted, lose electric or telephone service for nonpayment, and go without needed medical or dental care. Although hardship is correlated with low income, they are not identical (Gershoff, Aber, Raver, & Lennon, 2007; Mayer & Jencks, 1989).

Income Inequality

Increasing income inequality—the gap between the highest and lowest incomes within a society—may be as important as absolute levels of income or poverty (Blank, Danziger, & Schoeni, 2006). The "Occupy Wall Street" movements of 2011 called attention to the large discrepancy between rich and poor in the United States. From 1980 through 2005, the number of U.S. children living in middle-income (200%–399% of poverty threshold) families declined from 41% to 32%. At the same time, the percentage of children living in families with high incomes (more than 400% of poverty) was higher in 2005, at 30%, than in 1980, at 17% (Forum on Child and Family Statistics, 2008). Economic inequality gives rise to social inequality in many domains including family life, educational opportunity, neighborhoods, and housing (Neckerman, 2004). Social exclusion, a related concept used widely in European policy discussions, includes inequalities in basic living, family economic participation, housing, health, education, public space, and social participation, as well as the subjective experience of social exclusion (Kahn & Kamerman, 2002).

Poverty and Child Development

Children growing up in poverty are at a disadvantage in almost every domain of development (Duncan & Brooks-Gunn, 2000; Huston & Bentley, 2010). In a nationally representative sample of children whose mental development was evaluated at age 24 months with the Bayley Scale of Infant Development, children from low-income families (less than 200% of poverty) scored more than half a standard deviation lower on average than did those from more affluent families (Halle et al., 2009). By the time children reach kindergarten, the inequalities in skills associated with family income are even larger; moreover, the achievement gap between poor and nonpoor children widened dramatically from 1980 to the early 2000s (Reardon, 2011). Of course, the reasons for developmental differences associated with poverty are complex and multiple, but there is increasing evidence that they originate in early experience.

Importance of Early Experience

Not only are differences associated with poverty evident from the early years, but longitudinal evidence suggests that poverty in the first 5 years has more

lasting effects than does poverty later in childhood. In a long-term study of family income, early poverty predicted adult obesity (Ziol-Guest, Duncan, & Kalil, 2009) and adult earnings and work hours (Duncan, Ziol-Guest, & Kalil, 2010); poverty in the first 5 years of life was a more important predictor than poverty experienced later in childhood and adolescence. There is now a consensus that the foundations for such adult health problems as heart disease and hypertension begin in childhood (e.g., Gregory et al., 2009).

Biodevelopmental Framework

Using emerging knowledge about early brain development, Shonkoff (2010) proposed a biodevelopmental framework incorporating three areas of early experience: (a) relationships that provide nurturing responsive caregiving versus neglect or abuse; (b) physical and built environments that promote or threaten health (e.g., toxins), and (c) appropriate versus poor nutritional environments. Each of these three components interacts with the child's genetic makeup to affect basic biological and neurological "footprints" that have long-term consequences for physical and mental health as well as educational attainment.

Taken together, the emerging information about the importance of early environments points to early childhood as an especially critical time for policies that insure health-promoting circumstances for children. Poverty increases the likelihood that children will lack such environments.

Nurturing environments.
Parents raising children in poverty face obstacles that reduce, in some cases, the positive caregiving they provide. The psychological stresses of low income can lead to parents' psychological distress, which, in turn, increases the likelihood of harsh parenting and low nurturance toward their children (McLoyd, Aikins, & Burton, 2006). Their homes offer less cognitive and language stimulation than more affluent homes (Bradley, 2003). Similarly, the child-care environments experienced by poor children, on average, are of low quality offering little in the way of intellectual stimulation or support for development (Phillips & Lowenstein, 2011).

Physical environments.
The physical environments experienced by children living in poverty pose relatively high risks of air, water, and noise pollution, which can in turn affect children's health as well as cognitive and social development (Cole &

Winsler, 2010; Evans, 2006; Forum on Child and Family Statistics, 2008). Children living in poverty are more likely than nonpoor children to have elevated blood lead levels, particularly if they are African American (Evans, 2006). One set of authors estimates that elevated exposure to lead and other pollutants could account for up to one fourth of a standard deviation in achievement test scores (Dilworth-Bart & Moore, 2006). Many poor children live in neighborhoods that expose them to violence and other threats to safety. The physical and social hazards in housing and neighborhoods can produce high levels of stress that require children to expend both cognitive and emotional resources in vigilance and self-protection (Evans, 2004).

Nutritional environments.
In 2009, 17.2 million children (23% of all children) lived in households in which either adults or children were "food insecure," meaning that, at times, they were unable to acquire adequate food for active, healthy living because they had insufficient money or resources. Almost one million children lived in "very low food security" households, meaning that the food intake of household members was reduced and their normal eating patterns were disrupted; they sometimes had to skip meals or did not eat for a whole day (Fiese, Gunderson, Koester, & Washington, 2011; Forum on Child and Family Statistics, 2011).

Policies Affecting Children in Poverty

Unlike most European countries, in which many family benefits and services are offered as society's contribution to all families with children, many United States policies can be thought of as a safety net, intended to help those who are falling or failing, though the net is often frayed. As a result, eligibility for most forms of family support is based on family income. Currie (2006) reviewed U.S. child policies for low-income families with children from an economic perspective, arguing persuasively that their effectiveness depends on the net that they form—that is, all are needed, and significant holes in the net would be produced by elimination of one or more of them.

The recession that began in 2008 put the safety net to a test. When it was most needed by families, did it protect them from the consequences of high levels of unemployment and, in many cases, loss of housing? The answers are mixed. In some respects, the safety net failed, but in others it operated to prevent very severe poverty and hardship for some families with children. In what

follows, I consider the nature and adequacy of policies in the five domains discussed by Currie (2006): employment and income supports; food security and nutrition; early care and education; health care; and housing.

Employment and Income Supports

Cash assistance.
In the 1980s and 1990s, major changes in income supports for low-income families were designed to promote employment through both sanctions and incentives. The entitlement program, Aid to Families with Dependent Children (AFDC), popularly known as "welfare," was eliminated in 1996 and replaced with Temporary Assistance to Needy Families (TANF). One cornerstone of the new program was work (see Greenberg et al., 2002 for details of changes). Recipients could be required to work or participate in mandated activities to seek work; failure to do so could and did result in sanctions and loss of grants. States were given block grants and considerable autonomy in deciding such things as eligibility, specific work activities, and time limits. During the late 1990s, the number of families receiving TANF plunged, and employment among single mothers increased. Both trends were touted as signs that welfare "reform" had succeeded (Haskins, Primus, & Sawhill, 2002).

Tax incentives for employment.
During the same time period, tax incentives and supports for employment were expanded. The Earned Income Tax Credit (EITC), which supplements the earnings of the working poor, was expanded by raising the maximum benefit from $1,235 in 1991 to $3,556 for a family with two or more children in 1996; it continued to increase at a slower rate in the 2000s to $4824 in 2008. Families with children are the principal beneficiaries. For adults without children, only those with very low incomes are eligible, and the maximum credit was $438 in 2008 (Eamon, Wu, & Zhang, 2009). In 2010, about 28 million tax filers received the credit (Tavernise, 2012). Unlike most other credits and exemptions for children in the tax code, the EITC is refundable; that is, if the credit is larger than the taxes owed, the difference is paid as a refund. Analyses of the impact of the EITC on family wellbeing estimate that it reduced the percentage of children living in poverty; about one in five children whose families would have been poor without the EITC were raised above the poverty threshold in 2005 (Eamon et al., 2009).

Effects on children and families.

The effects of employment-based welfare policies on parents and children were studied extensively in both random-assignment experiments and longitudinal studies in the 1990s and early 2000s. Overall, policies that promoted employment for welfare clients were successful in increasing employment rates, but average family income did not improve. People exchanged welfare for a low-wage paycheck, and many remained poor. When policies included earnings supplements and supports for child care, family incomes were raised, and children's academic and social development improved (Morris, Gennetian, Duncan, & Huston, 2009). One example of such a program was New Hope, which was tested in Milwaukee in the 1990s. Full-time workers received earnings supplements to bring their incomes above poverty level, child-care subsidies, and health-care subsidies. Children in their families had improved school performance, more positive social behavior, and lower behavior problems than those in a control group (Duncan, Huston, & Weisner, 2007).

Although employment-based policies can be designed to promote family and child wellbeing, they leave out individuals who cannot or do not find paid work. Even in good economic times, scholars pointed out that the changes in welfare policy left a group of families with neither earnings nor welfare (Danziger, 2010). In 2008, only 67% of single mothers had any employment (Danziger, 2010). Among low-income single mothers with no other adult earner in the household, the percent who were "disconnected," that is, jobless and without cash assistance, rose steadily from a little over 10% in 1996 to about 25% in 2009, when jobs were scarce as a result of the recession. These mothers are extremely poor and often have barriers to employment (Danziger, 2010; Loprest & Nichols, 2011). Despite dramatic increases in national unemployment rates beginning in 2008, the number of families receiving TANF remained low through 2010, indicating that the safety net did not respond to their increased need (Danziger, 2010; DeParle, 2012).

Food and Nutrition

Supplemental Nutrition Assistance Program.

One of the few poverty programs available to all children and adults with low incomes is the Supplemental Nutrition Assistance Program (SNAP), popularly known as food stamps. SNAP provides families with an estimated

22 million children, about 29% of all children in the United States, with resources to purchase a nutritionally adequate diet. About 70% of SNAP funds go to families with children (Keith-Jennings, 2012). A number of studies show that the program reduces poverty by moving family incomes closer to the poverty threshold and/or raising them above it (Center for Budget and Policy Priorities, 2013; Tiehen, Jolliffe, & Gunderson, 2012). The trend in use of food stamps indicates an increase in the number of poor adults and families needing basic supports; it contrasts sharply with the trend for cash welfare (Danziger, 2010).

Nutrition programs.
The federal government funds a number of nutrition programs for children and pregnant women. The largest is the School Lunch Program, providing free and reduced school lunches for children in low-income families as well as snacks in after-school programs and lunches in nonprofit child-care residential settings. The program subsidized lunches for 31 million children per day in 2010 (U.S. Department of Agriculture, 2012c). Similarly, the School Breakfast Program provided free and reduced price meals to 9.1 million children in 2009 (U.S. Department of Agriculture, 2012c). The Child Care and Adult Food Program provides meals and snacks for more than 3.2 million children and 112,000 adults each day as part of the day care they receive (U.S. Department of Agriculture, 2012a). The Women, Infants, and Children Program (WIC) provides nutritional food for pregnant women and children. In fiscal 2011, it served 8,960,587 families (U.S. Department of Agriculture, 2012d). Evidence indicates that it can improve birth outcomes and increase infants' ingestion of important nutrients (Foster, Jiang, Gibson-Davis, 2010; Yen, 2010). Smaller programs offer school breakfasts and meals during the summer (Fiese et al., 2011).

Effects on food insecurity.
I noted earlier that many families with children experience food insecurity; hence, evaluations of the publicly supported programs have focused on whether they reduce food insecurity. Overall, these programs reduce food insecurity, but interpretation of the results is complicated by the fact that people who use the programs are considerably more in need than are eligible families that do not use the programs. As a result, children sometimes remain more food-insecure even with the available programs (Fiese et al., 2011).

Early Education and Care

Early intervention and education.
Funding programs for early education and child care include programs to promote school readiness for children from low-income families and programs to help working parents with the cost of child care. The first major federal early intervention program was Head Start, begun in 1965, which serves 3- and 4-year-olds. More recently, as the importance of the first years of life became apparent, Early Head Start was launched. It offers a mix of family-based and center-based services for children from infancy through age 3. The Nurse–Family Partnership home-visiting programs for pregnant women before and after the birth of a child are now widely funded across the country (Olds, Sadler, & Kitzman, 2007). All of these programs address health, nutrition, and children's socioemotional needs as well as cognitive and language stimulation, and all them emphasize parent and family involvement.

State prekindergarten programs are more narrowly focused on pre-academic skills that will prepare children for formal schooling; they now exist in 40 states. Although most restrict eligibility to children at risk of low achievement (e.g., children from families with low incomes, with limited English proficiency, or with special needs), a few states offer universal prekindergarten to all 4-year-old children. About 38% of the nation's 4-year-olds and 11% of 3-year-olds are enrolled in Head Start and prekindergarten programs (National Institute for Early Education Research, 2011).

Early intervention and education programs are not designed to affect poverty in the short run, but to reduce poverty in the next generation by remediating some of the academic and social disadvantages associated with poverty. A strong body of evidence based on experimental studies of demonstration programs as well as longitudinal research supports the effectiveness of these early interventions for children's development (Duncan, Ludwig, & Magnuson, 2007). Children who have received early education enter school better prepared in basic academic skills, particularly reading (Gormley, Gayer, Phillips, & Dawson, 2005). Experimental studies have shown that the effects of well-planned interventions are not limited to short-term gains, but also last into adulthood (Campbell et al., 2008; Karoly, Kilburn, & Cannon, 2005). Although impacts on test scores tend to fade out with age, both small demonstration interventions and large-scale programs have produced long-term impacts on such areas of adult functioning as

high-school graduation, college attendance, "idleness," crime, teen parent-hood, and health status (Deming, 2009; Karoly, 2011).

Child care.

Unlike early intervention programs, which are designed primarily to promote child development, assistance with child care is intended to support parental (maternal) employment. It is one cornerstone of the policy requiring low-income single mothers to be employed. As part of the 1996 changes in the welfare law, four child-care subsidy programs were consolidated into the Child Care and Development Block Grants fund (CCDBG), which provides federal funding to states to subsidize child care for low-income working parents. Funding for child care almost doubled in the 1990s (Fuller, Kagan, Caspary, & Gauthier, 2002), but has remained steady or declined since that time (Zedlewski & Zimmerman, 2007). The CCDBG program served 1,694,200 children in an average month in 2011 (http://www.acf.hhs.gov/programs/occ/data/ccdf_data/10acf800_preliminary/list.htm), but there were waiting lists in 17 states, including California, Texas, and New York, the three states with the largest child populations (National Association of Child Care Resource & Referral Agencies, 2011). The federal government also offers tax credits for child care, but, unlike the EITC, they are not refundable—that is, they are available only to reduce the taxes owed. Therefore, they are less likely to benefit low-income parents.

Although programs for young children can affect children's development and family financial wellbeing regardless of the label attached to them, the policy goals of early education are primarily to improve children's academic and social skills, whereas the policy goals of child-care subsidies are primarily to promote parental (usually maternal) employment. Much of the research on child-care subsidies is, therefore, designed to investigate effects on employment. The data shows consistently that subsidies increase the likelihood that mothers will be employed, even when jobs are relatively scarce (Blau & Tekin, 2007; Gorey, 2009). Moreover, experimental tests of enhanced child-care subsidy policies have demonstrated that increased availability or affordability (e.g., raising income thresholds, reducing out-of-pocket costs) increased employment and the use of subsidies. As a result, parents were more likely to use center-based care, which may have accounted for the reduced frequency of such child-care problems as caregiver illness or sudden unavailability that interfered with employment (Gennetian, Crosby, Huston, & Lowe, 2004).

Child-care subsidies can be used for any type of care. In contrast to Head Start and other early education programs, there are no requirements to guarantee quality of care or even basic safety. The federal government does require that states use at least 4% of their grants for quality enhancement, but the funds are used for a range of activities including basic inspections and licensing. Observational studies indicate that many children from low-income families receive low-quality child care, particularly in the informal settings often used by their parents (Phillips & Lowenstein, 2011). On average, the center-based care they receive is higher quality than other forms of care (Coley, Li-Grining, & Chase-Lansdale, 2006). Welfare and employment programs can promote parents' use of center-based care in the preschool years; when they do, their children display slightly fewer behavior problems in elementary school than do children who do not experience child care or who are in other types of care (Crosby, Gennetian, Dowsett, & Huston, 2010). There is evidence, however, that children receiving subsidized care have more behavior problems than comparable children not in such care (Herbst & Tekin, 2010). Regardless of the type of care, quality matters. In a large sample of children from very low-income families, children experiencing high-quality care displayed fewer behavior problems across several years in elementary school (Votruba-Drzal, Coley, Maldonado-Carreño, Li-Grining, & Chase-Lansdale, 2010).

Health and Health Care

Since 1965, Medicaid has provided health insurance for children, the elderly, the disabled, and some adults between 18 and 65. All children in families below the poverty threshold are eligible, as are some of their parents. In 2008, Medicaid was projected to provide health coverage for 31 million children, 17 million adults (mostly low-income working parents), 6 million seniors, and 10 million persons with disabilities. Although about half of all Medicaid enrollees are children, they account for just one fifth of Medicaid spending (Center for Budget & Policy Priorities, 2013).

The Children's Health Insurance Program (CHIP) began in the late 1990s and was reauthorized with significant expansions and changes in 2009, including a higher level of federal matching funds. States can elect to offer the program, for which they must provide some of the costs. Forty-six states and the District of Columbia cover children up to or above 200% of the Federal Poverty Level (FPL), and 24 of these states offer coverage to children in families with incomes at or above 250% of the FPL. States may

get the CHIP enhanced match for coverage up to 300% of the FPL ($67,050 for a family of four in 2011) (http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Childrens-Health-Insurance-Program-CHIP/CHIPRA.html).

With the expansions in 2009 as well as the recession, enrollment in both Medicaid and CHIP increased from 40.2 to 42.7 million children, representing an increase from 82 to 85% of those eligible. States varied considerably in the percentage of eligible children enrolled, with relatively low percentages in three large states: California, Texas, and Florida (Kenney et al., 2011).

Overall, Medicaid and the CHIP successfully countered the trend for children to lose health coverage in the private sector as parents lost employment and employers reduced coverage in the few years prior to 2011. The percentage of children who were uninsured was lower in 2010 than in 2007, before the economic downturn started, because Medicaid and CHIP expanded and offset the loss of parents' employer coverage among children. In 2010, the number of children with employer-based coverage fell by 800,000, but 700,000 children gained coverage through Medicaid or CHIP (Kenney et al., 2011).

The Physical and Social Environment: Housing and Neighborhood

Low-income families face problems of finding and paying for housing, resulting in housing instability and homelessness for some. In one sample of low-income young families from 20 U.S. cities, 9.8% experienced homelessness and an additional 23.6% had a doubled-up episode during the first 5 years of their child's life. Although mothers experiencing homelessness had elevated levels of anxiety and health problems, evaluations of young children in these families indicated that health problems and low performance on cognitive tasks were associated more generally with poverty, but not specifically with homelessness (Park, Fertig, & Allison, 2011; Park, Fertig, & Metraux, 2011).

Housing assistance.
The Department of Housing and Urban Development oversees three types of programs to provide decent and safe rental housing for eligible low-income families, the elderly, and persons with disabilities. Public housing units are owned and maintained by local housing authorities. Approximately 1.2 million households live in public housing units, but it is not clear how many

of them are families with children (http://portal.hud.gov/hudportal/). Housing choice vouchers (Section 8) can be used for rentals in the private housing market that meet certain requirements. Recipients pay no more than 30% of their adjusted income in rent, and the voucher pays the additional rent. In many places, there are long waiting lists for both public housing and Section 8 vouchers (Currie, 2006). The Low Income Housing Tax Credit is offered to developers who guarantee to include a certain percentage of low-income units in their development (Currie, 2006). Because these programs serve only about 30% of eligible renters, Currie (2006) argues that they are inequitable, providing large benefits to some people while leaving others with no housing assistance.

Neighborhood changes.
Many people with low incomes live in racially segregated neighborhoods with others who are poor. Neighborhood disadvantage is typically indexed by poverty rates as well as by high rates of crime and violence. Poor neighborhoods differ from affluent neighborhoods in opportunities for recreation, transportation, grocery stores with healthy food, public services, quality child care and schools, out-of-school programs, jobs for adults, levels of pollution, and safety hazards in housing. Living in a poor neighborhood adds to the effects of family poverty on children's academic and social development. In their extensive review of the literature, Leventhal and Brooks-Gunn (2000) conclude that high neighborhood SES contributes to improved school achievement and educational attainment, and that low neighborhood SES increases the likelihood of deviant and problem behavior.

One policy solution is to help low-income families move to neighborhoods that are more racially or socioeconomically mixed than public housing. In the 1970s, the Chicago Housing Authority, under court order, provided opportunities for public housing residents, almost all of whom were African American, to move to racially mixed neighborhoods. Follow-up research indicated that children in families that moved to predominantly white suburban areas reaped some academic benefits (Kaufman & Rosenbaum, 1992).

These findings led the Department of Housing and Urban Development to sponsor a large-scale experiment to determine the effects of moving from public housing with high concentrations of poverty to low-poverty neighborhoods. The Move to Opportunity study offered Section 8 vouchers that could be used only in low-poverty neighborhoods; control groups received unrestricted vouchers or no special offer to move out of public

housing. Ten to fifteen years after the program began, families in the treatment group lived in better quality housing and safer neighborhoods. Possibly because safety was a principal reason that people wanted to move, there were some benefits for adult psychological wellbeing and health. Economists thought moves would provide better access to jobs, but there were no impacts on work or earnings and inconsistent impacts on children and adolescents. The group that received unrestricted Section 8 vouchers showed many of the same benefits as those who were required to move to low-poverty neighborhoods (Sanbonmatsu et al., 2011). It appears that providing opportunities to move out of public housing has no effects on poverty or economic wellbeing and at best modest effects on health and psychological wellbeing.

Environmental toxins.
Both housing and neighborhoods pose physical hazards to children living in poverty, but there is little evidence about whether or how the major housing policies affect the levels of pollution, toxic substances, and noise to which children are exposed. Policies to address toxic environmental threats are separate from low-income housing policies. For example, it is well established that exposure to even small amounts of lead is detrimental for children's cognitive and social development. Over the years, policies to reduce exposure to lead have been enacted to protect the public from lead in gasoline, paint, drinking water, toys, and soil, but industrial processes and airplane fuel continue to emit lead into the environment. Screening for lead exposure is not universal and could be improved. With new evidence that even low levels of lead exposure can be harmful, experts suggest that the "acceptable" level of blood lead be reduced (Cole & Winsler, 2010).

Conclusions

Does the Safety Net Work?

Programs in the five domains I have discussed—economic and income supports, food and nutrition, early care and education, health care, and the physical and social environment—constitute major components of the safety net in the United States. Many more programs operate at the federal, state, and local levels. Because most federally funded programs are administered by state and local entities, require states to contribute matching funds,

and allow some latitude in the ways the programs are configured, there is considerable variation across states. Although programs in the five domains discussed here are separate policies administered by different agencies and under different rules, they are interrelated in the lives of the individuals they serve. The purpose of a safety net is to protect children and their families from harm—to provide minimal conditions for healthy development. In some instances, antipoverty policies aspire to more ambitious goals of reducing poverty in the short and long term and reducing some of the deleterious consequences of poverty for children. The evidence suggests that, without the current safety net, many more children would suffer the consequences of poverty. Some of the income assistance programs (primarily the EITC), child-care subsidies, and housing assistance reduce child poverty directly and indirectly. Many programs reduce hardship by providing food, medical care, and housing.

On the other hand, the United States continues to have high rates of child poverty and rising income inequality despite the current policies (Lim, Yoo, & Page, 2010). Some safety-net programs responded to the 2009 economic recession with increased assistance (e.g., food stamps), but others did not (e.g., cash welfare). Many of the programs that responded most effectively were entitlement programs that must serve all eligible participants. Food stamps, free and reduced-cost school lunches, and Medicaid are all entitlements, as are programs administered through the income tax system. For low-income families, the primary tax benefit is the Earned Income Tax Credit, but the Child Tax Credit and Child Care Tax Credits are also used by some low-income parents. Parenthetically, most government benefits for nonpoor families are entitlements administered through the tax system (e.g., exemptions for dependents, deductions for home mortgages and property taxes) or made universally available, as in the case of public schools.

Many safety-net programs (e.g., TANF, WIC, child-care subsidies, early intervention and education, CHIP, and housing assistance) are not entitlements. The number of participants is limited by the amount budgeted at both federal and state levels. Typically, a total amount will be established at the federal level and then awarded directly to programs (e.g., Head Start) or, as is increasingly popular, given to states in block grants that require some level of state matching funds. Because the total expenditure is fixed, the nonentitlement programs typically do not serve all eligible families. When state budgets are stretched thin, as was the case during 2008–2010, services for poor families are often cut rather than increased.

Do Programs Address Biodevelopmental Processes?

We now know that many of the deleterious consequences of poverty begin in the very early years of life. Policies providing cash and other resources to poor families may improve children's early experiences, but Shonkoff's biodevelopmental model points specifically to three basic needs to build a healthy foundation during the early years: nurturing and supportive caregiving, a healthy physical and built environment, and good nutrition. Policies affecting these early experiences may have short-run benefits, but they also have important consequences for physical, intellectual, emotional, and economic health in later childhood and adulthood. Early interventions for parents and children (e.g., home visiting, Head Start, prekindergarten) as well as child-care-quality initiatives are important means of improving nurturing environments for children from infancy through the early years. Some of these efforts have been increased in recent years, but the quality of child care, particularly for infants and toddlers from low-income families, remains quite low (Phillips & Lowenstein, 2011).

Policies affecting children's built and physical environments include housing subsidies and reduction of exposure to toxins. As noted, there has been considerable progress in lead abatement and other environmental policies. Some families with children receive subsidized housing, but there is relatively little information about the quality of the housing or possible benefits that it may provide.

Although the supplemental nutrition and child-care meal programs probably benefit very young children, WIC is specifically targeted to early development, beginning during pregnancy. WIC not only offers food vouchers, but also provides group counseling about maternal health during and after pregnancy. It serves a large portion of the low-income population during pregnancy and early infancy, but serves fewer children from ages 1 to 4, even though they are eligible. Efforts to promote breastfeeding as part of WIC have met with some limited success, and children in WIC families do receive more of the important nutrients than those not receiving the program.

What Next?

Poverty and income inequality are affected by social and economic forces on which public policies have limited influence. Nevertheless, public policies can reduce child poverty and its consequences. In this chapter, I have attempted

to build on Currie's (2006) framework of the safety net, supporting her argument that these policies are an integrated set of supports for low-income families that constitute more than the sum of each individually. The safety net is frayed in some respects, and many people are falling through its holes. We can do a better job by examining the characteristics of policies that are successful as well as those that are insufficient to address the needs of our children.

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16

Early Life Stress and Neurobehavioral Development

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Physical and mental health outcomes as diverse as depression, anxiety, obesity, and substance abuse share at least one commonality—that they are often associated with adverse experiences in childhood (see for review, Shonkoff, Boyce, & McEwen, 2009). Epidemiological studies have documented this association, suggesting that familial and caregiving contexts may be especially important for later health and wellbeing. Evidence suggests that family environments that increase the risk of poor health outcomes are characterized by overt conflict, recurrent anger and aggression, and deficient nurturing (Repetti, Taylor, & Seeman, 2002). Numerous mechanisms likely are involved in transducing the impact of early experiences into impacts on neurobehavioral development and health. However, most models argue that stress physiology plays a role, both in producing the initial effects and, because early experiences may shape the regulation of these systems, in maintaining their effects over time (McEwen, 2008).

Stress is the body's response to challenges that pose a threat to wellbeing (Selye, 1975). These threats are termed stressors. Many stressors are physical and include everything from the body becoming too cold or too hot to the body being invaded by a pathogen or experiencing tissue damage (see for review, Gunnar & Vazquez, 2006). With development, we come to anticipate stressors and thus can activate the body's stress-defense system in order to avoid harm. Our bodily stress-defense systems have also come to be triggered by events associated with danger throughout the evolution of our species. For young children, separation from attachment figures activates

the stress system (Mendoza, Smotherman, Miner, Kaplan, & Levine, 1978). They have also come to be stimulated by psychological threats to social standing or relationships (Dickerson & Kemeny, 2004). The capacity to mount physiological stress responses when we perceive threats to wellbeing is critical to health. For this reason, McEwen has termed the activation of stress biology, allostasis, meaning the "maintenance of stability through change" (McEwen & Wingfield, 2010). The systems that are activated in response to stressors affect brain and body, but, when activations are rare and brief, the balance of effects is positive. Indeed, brief experiences of stress appear to enhance development (Levine & Thoman, 1970). However, when the systems are activated frequently for prolonged periods, the effects carry health and development costs that are referred to as allostatic load. In this chapter, we will briefly describe the complex physiology of stress. Then, we will consider how stress physiology is regulated by relationships in childhood. Next, we will discuss the effects of chronic or toxic early-life stress for neurobehavioral development. Finally, we will conclude with the implications of this work for policy and practice.

An Overview of Stress Neurobiology

The stress response is multifaceted, involving the autonomic, endocrine, and immune systems (Lupien, McEwen, Gunnar, & Heim, 2009). In response to stressors, these systems are activated and interact with one another in a dynamic fashion. Rather than one monolithic stress response, the activation of stress biology is more nuanced and stressor-specific (Joëls & Baram, 2009). Key to most stress responses, however, are activations of the sympathetic-adrenomedullary (SAM) system and the hypothalamic-pituitary-adrenocorical (HPA) system.

The Sympathetic-Adrenomedullary (SAM) System

Almost immediately upon exposure to a stressor, the sympathetic nervous system (SNS) is activated, while the parasympathetic nervous system (PNS) is simultaneously suppressed (see for review, Gunnar & Quevedo, 2007). In this process, catecholamines—predominantly epinephrine (EPI) but also some norepinephrine (NE)—are secreted from the adrenal medulla. NE is also released from sympathetic nerve terminals in the body and through NE neurotransmitter pathways in the brain. By binding to target receptors in

a number of organs, epinephrine and norepinephrine enable changes that mobilize the body and brain to respond to stress (Tasaptsaris & Breslin, 1989). Increases in cardiac output encourage vasodilatation in muscles and constriction of blood vessels in the skin and gut and, consequently, ensure adequate blood supply to the brain and muscles. In addition, epinephrine stimulates the breakdown of fat stores, which results in increased blood glucose levels and thus more energy to fuel defensive responses. Epinephrine and norepinephrine cannot readily pass the blood–brain barrier, so they cannot directly affect the brain; however, their increased activity in the periphery in response to stress is related to increased activity of norepinephrine produced in the brain by the locus coeruleus (Morilak et al., 2005). Brain norepinephrine supports increased vigilance, arousal, and attention. In addition, changes in the state of the body in response to sympathetic outflow are detected by the parasympathetic nervous system, which, through the vagus nerve, sends reports back to the brain over a pathway that involves the nucleus tractus solitarius (Porges, 1995). These signals reach the amygdala, a structure important in emotion, and help to integrate body and brain stress reactions. All of these reactions take place in seconds, which is why the SAM system is said to orchestrate "fight/flight" responses.

The Hypothalamic-Pituitary-Adrenocortical (HPA) Axis

Whereas activation of the SAM system results in the release of catecholamines, the hypothalamic-pituitary-adrenocortical (HPA) system triggers the synthesis and release into the bloodstream of glucocorticoid hormones (cortisol in humans and other primates; corticosterone in rodents; reviewed in Gunnar & Vazquez, 2006). Activation of the HPA system involves a hormonal cascade, beginning with the release of corticotrophin-releasing hormone (CRH) and arginine vasopressin (AVP) from the paraventricular nuclei of the hypothalamus. CRH and AVP interact with receptors on the anterior pituitary gland, where adrenocorticotropic hormone (ACTH) is synthesized and released. ACTH then binds to receptors on the cortex of the adrenal glands, stimulating the release of glucocorticoids.

Through their involvement in gene transcription, glucocorticoids induce widespread changes in the body, which include mobilization of energy to muscles, enhancement of cardiovascular tone, stimulation of immune function, inhibition of reproductive physiology, reduction in feeding and appetite, sharpening of cognition, and increases in local cerebral glucose

utilization (Sapolsky, Romero, & Munck, 2000). Many of the genes it influences are involved in brain growth and repair. Hence, the regulation of the HPA system is critically important for healthy neurobehavioral development.

It is important to note that glucocorticoids are not only released in response to stressors, but also in pulses across the day. In humans, the release of basal glucocorticoids follows a diurnal rhythm, whereby levels peak in the morning around the time of awakening and decline throughout the day, reaching their nadir 30 minutes after the onset of night sleep. Imposed on the diurnal rhythm, there is also a cortisol response to awakening. Specifically, cortisol increases about 40–60% in the 30–40 minutes after morning awakening and then decreases rapidly back to its diurnal slope. This facet of the basal system is called the cortisol awakening response or CAR (see for review, Adam, Klimes-Dougan, & Gunnar, 2007). Maintenance of a normal diurnal rhythm is a key component of health and chronic stress appears to disrupt this rhythm, tending to decrease peak morning levels while increasing late afternoon and evening levels. This flattening of the daily rhythm appears to be transient as normal rhythms typically emerge once the stressor is removed (Heim, Ehlert, & Hellhammer, 2000). The CAR is also sensitive to transient stress/challenge, being larger on days when challenge is anticipated and sometimes blunted in the context of chronic stress (Clow, Hucklebridge, & Thorn, 2010).

Finally, it is important to realize that cortisol has different effects on the brain when it is in basal and stress ranges. This is accomplished because, in the brain, cortisol binds to two types of receptor, mineralocorticoid receptors (MRs) and glucocorticoid receptors (GRs) (deKloet, Vreugdenhil, Oitzl, & Joëls, 1998). Cortisol binds more easily to MRs, and thus MRs are bound when cortisol is in basal ranges. Cortisol binds less easily to GRs, so only once MRs are filled does it bind with GR. This happens when cortisol rises above basal ranges in response to stressors. MRs mediate most of the health promotive effects of cortisol, while GRs mediate the stress effects of the hormone, which when chronic or frequent produces the wear and tear referred to as allostatic load.

Frontal and Limbic Regulation

The HPA and SAM systems do not operate in isolation. Rather, their activation results from a fine-tuned cascade of neural events involving a large number of brain regions and neurotransmitters (Joëls & Baram, 2009). Limbic and cortical regions relay information about threats that can activate

or terminate stress responses (Ulrich-Lai & Herman, 2009). Signals from the amygdala are critical in activating CRH-producing cells in the hypothalamus to start the cascade of events that ultimately elevates cortisol. Neural circuits in the medial prefrontal cortex are important in inhibiting overreactions of the amygdala, while neural circuits in the dorsolateral prefrontal cortex involved in executive functioning also interact with medial and ventral regions of the prefrontal cortex in ways that allow emotional information to affect "cold" reasoning and cooler aspects of reasoning to impact and help control emotional defensive responses. As the brain develops, these higher regions in the cortex become more involved in stress activation and regulation (see Gunnar & Vazquez, 2006). Earlier in development, caregivers provide regulatory input thus supporting development of the child's self-regulatory systems.

HPA and SAM Systems Conjointly

Although there are many calls to study the activity of these systems conjointly, and many researchers do measure cortisol and various measures of the sympathetic and parasympathetic nervous system activity, it is rare to find papers that successfully integrate these measures. There are many reasons for this. First, most of the situations we use as stressors actually do not activate the HPA axis, but do elicit responses of the autonomic nervous system (ANS) (Gunnar, Talge, & Herrera, 2009). The ANS responses are often associated with temperament, and thus reveal information about individual differences in emotionality (Fox & Calkins, 2000). Second, in adult studies tracking both sympathetic and HPA systems (e.g., Ursin, Baade, & Levine, 1978), sympathetic systems reflect the amount of effort required by the situation, which might be viewed either positively (thrilling) or negatively (frightening). In contrast, HPA axis activity is more closely aligned with perceived threat, in that it does not increase in situations that are perceived as exciting, demanding effort, but not threatening. Thus HPA and ANS measures often do not cohere, as they are sensitive to different elements of the context. Third, the combination of threat, plus uncertainty and lack of control are critical to activation of the HPA axis (Dickerson & Kemeny, 2004). As these are characteristics that describe the kinds of risky conditions associated with poor developmental outcomes (Repetti et al., 2002), in the remainder of the chapter we will focus on the HPA system, bringing in discussion of the SAM system when appropriate.

Regulation of Stress by Relationships in Early Childhood

Relationships with caregivers are important to healthy development, fostering social competence, emotion regulation, and cognitive growth in children. In addition, caregivers play an important role in buffering children from stress. Both human and animal models suggest that caregivers can serve as regulators of the stress-sensitive HPA system (Gunnar & Donzella, 2002). In this section, the idea of caregivers as stress regulators will be explored, with evidence from studies of rodents and nonhuman primates, as well as children, to be considered. Because animal studies allow examination of biological mechanisms, integrating them into discussions of stress in human development provides a more complete understanding of the processes through which early adverse experiences get "under the skin" to influence neurobehavioral development.

Rodents.   During early development, the rats' HPA axis is relatively quiet, with generally low basal levels and small elevations in response to stressors. This has been termed the relative stress hyporesponsive period (SHRP) and it lasts until about the time that the rat pup begins to explore beyond the nest (Levine, 2005). Critically, it is the presence of and stimuli from the mother rat that maintain the SHRP, as removal of the mother for 12 to 24 hours will produce corticosterone elevations while provision of the critical stimuli (i.e., maternal licking and grooming and milk into the gut) keeps the HPA system in its low-response state (Suchecki, Rosenfeld, & Levine, 1993). It is interesting that during this period rat pups who learn to find the mother by her odor will learn to approach an odor paired with pain, rather than avoid such odors (Moriceau, Roth, & Sullivan, 2010). However, when corticosterone levels rise at the end of the SHRP, or when they are elevated through experimental manipulations, this learning shifts to the adult form. Taken together these findings indicate the critical importance of maternal stimuli in maintaining low stress levels in the infant rat and of low stress levels in keeping the infant near the mother, even if she is clumsy and sometimes does things that hurt the infant.

Monkeys.   In nonhuman primates, contact with the mother is also a powerful regulator of the HPA axis. Separation produces large increases in cortisol (Smotherman, Hunt, McGinnis, & Levine, 1979). However, when the infant is with the mother or is able to interact with her even at a distance, her presence reduces and even stops the infant from producing elevations

in cortisol to otherwise distressing experiences such as being captured and moved to a new cage (Gunnar, Gonzales, Goodlin, & Levine, 1981).

Children.   In children, we have very similar evidence of relationships as regulators of stress responses. Indeed, maternal sensitivity is predictive of cortisol recovery following a mild stressor in infants as young as 3 months (Albers, Riksen-Walraven, Sweep, & de Weerth, 2008). Studies in both laboratory and naturalistic settings have shown that toddlers in secure attachment relationships do not show increases in cortisol following distressing events, whereas toddlers in insecure attachment relationships do (Gunnar & Donzella, 2002). For example, toddlers receiving their well-baby inoculations did not show elevations in cortisol to these shots if they were securely attached to the parent who was with them, but did if the attachment relationship was insecure. Similarly, toddlers who were frightened of novel stimuli (i.e., the approach of a clown) did not show cortisol elevations if they were with a parent with whom they had a secure attachment relationship, but did if the relationship was insecure. In addition, the caregiving environment continues to be of importance into later childhood and adolescent years, with family conflict tending to be a strong elicitor of the cortisol response (Repetti et al., 2002). Findings such as these illustrate that not only are attachment relationships powerful buffers of children's HPA stress system, but they show that even normative variations in relationship quality and family function influence the capacity of the parent to help the child regulate stress.

Not only can adults help young children regulate stress, separation from attachment figures is a potent activator of the stress system. When toddlers are placed into a new child-care setting, they exhibit marked elevations in cortisol on the first day and on each day for several weeks (Ahnert, Gunnar, Lamb, & Barthel, 2004). Even after they have adapted to child care and no longer show elevations in the morning at drop-off, young children show a slow increase in cortisol levels over the child-care day (Dettling, Gunnar, & Donzella, 1999). Age matters in this effect, with these elevations decreasing as children get older until they are no longer typically noted around 5 years of age. Importantly, when followed over time, these daily elevations in cortisol at child care have little to no effect on children who are low in behavioral inhibition, but may shape a more anxious phenotype in those who are more highly inhibited (Gunnar, Kryzer, van Ryzin, & Philips, 2011). We will return to the importance of behavioral inhibition as a moderator of early-life stress later in this chapter.

Toxic Stress Due to Deprivation, Neglect, and Relationship Disruption

If the presence of and brief separation from caregivers has such profound effects on the HPA axis, we would expect that regular disturbances in caregiving would be important to the development of stress reactivity and regulation. Indeed, there is evidence that it does. Again, we will use data from rodents, nonhuman primates, and children to illustrate this point.

Rodents. In rats, we have known for over a half-century that brief (i.e., 3–15-minute) separations daily over the early days of life result in increased maternal stimulation of her pups and pups that grow up to be more stress-resilient (Levine, 2005). In contrast, prolonged (e.g., 3-hour) separations repeated over the same period result in disrupted maternal care and pups that grow up to be stress-vulnerable (Sanchez, Ladd, & Plotsky, 2001). Heightened startle responses, increased freezing behavior, and stronger HPA stress responses have all been observed in adult rats exposed to prolonged maternal separations (Cirulli & Alleva, 2003). Notably, similar effects are observed when the mother rats who express the extremes in mothering are identified even if they mother pups that were fostered at birth (Meaney & Szyf, 2005). Thus these effects appear to be due to the quality of care the pups experience, rather than to mother–pup shared genes.

Recent work on gene methylation illustrates one pathway by which maternal care may shape later stress responsivity in the rat. This research indicates that high maternal care results in decreased methylation of the GR gene in the hippocampus (Meaney & Szyf, 2005). Methylation, in effect, silences genes, so pups receiving more maternal care (in the form of more licking and grooming) end up with a greater number of GRs. Because hippocampal GRs are involved in the termination of stress responses, more receptors translate to more efficient control of the HPA axis and, hence, increased resilience to stress. Thus, accumulating evidence suggests that maternal care has important consequences for the developing stress system in the rodent.

Monkeys. Similar research questions have been posed in studies of non-human primates, who more closely resemble us with respect to brain maturation and development. Such work has utilized a range of methods, including peer-only rearing, isolation rearing, repeated maternal separations,

and other disruptions of maternal care (Sanchez et al., 2001). Though the methods are variable, the overriding message is the same—that adequate parental stimulation and care are critical to the development of a well-functioning stress system. Experimental manipulations resulting in deprivation or disruption of maternal care have been associated with the development of anxiety, fearfulness, and hyper-reactive stress responding in monkeys (Suomi, 1995). Other primate studies have reported increased CRH concentrations of the cerebrospinal fluid and altered diurnal activity of the HPA axis as long-term consequences of repeated, unpredictable maternal separations, unpredictable maternal feedings, and spontaneous maternal abuse (Sanchez, 2006). Moreover, it may be the higher levels of the stress system (e.g., amygdala, medial prefrontal cortex) that are most affected by adverse care in primates, given that they undergo a more prolonged maturation period postnatally (Gunnar & Fisher, 2006).

Children. Research also suggests that deprivation and neglect early in human development affects the reactivity and regulation of stress systems. This work has examined development in the context of conditions such as maternal depression, emotional and physical neglect, and institutional rearing (i.e., orphanage care).

Maternal depression.
There is increasing evidence that maternal depression is associated with altered activity of the HPA axis in children. In addition to shared genetics, high levels of depressive symptoms in the mother, which likely interfere with responsive caregiving during the child's first year of life, appear to have long-term impacts on the HPA axis (Essex, Klein, Cho, & Kalin, 2002; Halligan, Herbert, Goodyer, & Murray, 2004). Increased activity of the HPA axis associated with early maternal depression also appears to mediate the development of more internalizing behavior problems in children (Smider et al., 2002) and depressive symptoms in adolescents (Halligan, Herbert, Goodyer, & Murray, 2007).

Neglect.
Much of our attention in studies of maltreatment has been on the effects of physical and sexual abuse. Nonetheless, neglect and emotional maltreatment seem to be the forms most associated with alterations in the HPA axis (Tarullo & Gunnar, 2006). Neglect is also the most common form

of maltreatment (USDHHS, 2010), is pervasive and often co-occurs with other forms of abuse. Chronic stress results in a down-regulation (reduction) in the production of cortisol as the HPA system makes adjustments to avoid running chronically high steroid levels, which can be very damaging (Miller, Chen, & Zhou, 2007). However, cortisol measures can appear normal to low, despite HPA hyperactivity at higher levels of the system (Heim et al., 2000). Studying preschool-aged children entering a new foster placement, Bruce and colleagues (Bruce, Fisher, Pears, & Levine, 2009) noted that a larger than expected number of these children had extremely low morning cortisol levels. These were the children who had been exposed to more profound neglect. A few children had excessively high morning cortisol levels. These were the ones who experienced more emotional maltreatment. Placement in a treatment-enriched foster home as opposed to regular foster care, however, helped support more normal morning cortisol levels (Fisher, Stoolmiller, Gunnar, & Burraston, 2007). Among adults who experienced maltreatment in childhood, cerebral spinal fluid concentrations of CRH were associated with a history of more emotional maltreatment (Heim & Binder, 2012). In a study of the brains of adults who had committed suicide, maltreatment in childhood was also found to be associated with greater methylation of the same gene in the hippocampus that was hyper-methylated in the rat studies of low quality of maternal care (McGowan et al., 2009).

Institutional rearing.
The impact of neglect on human development is starkly revealed in the study of children cared for in institutions early in life and then either adopted or fostered into families. These children show profound developmental delays while in institutional care and remarkable rebounds in all aspects of development once placed in supportive families (see McCall, van IJzendoorn, Juffer, Groark, & Groza, 2012). However, despite years in supportive homes, children experiencing institutional neglect early in life are at increased risk of socioemotional and cognitive problems. Like the young children in foster care described above, toddlers in institutional care exhibit low early morning cortisol levels and a particularly flat cortisol slope across the day (Gunnar & Vazquez, 2001). The diurnal pattern normalizes with time once children are adopted, but for some children basal cortisol levels remain high. These children with high cortisol production seem to be those who were the most profoundly growth delayed at adoption, suggesting that slowed growth in response to early life stress is an index of allostatic load

in young children (Johnson, Bruce, Tarullo, & Gunnar, 2011). There is also emerging evidence that elevated cortisol levels years post adoption may mediate some of the socioemotional impacts of early deprivation (Johnson et al., 2011).

Individual differences.

If there is one thing we have learned in developmental psychology/psychopathology, it is that not all individuals respond similarly to experiences that threaten health and wellbeing. Some individuals become much more maladapted in response to adversity than do others. In the stress literature, such individual differences are studied using stress-diathesis models or more recently sensitivity to context (Boyce & Ellis, 2005) or differential susceptibility (Pluess & Belsky, 2009) models that also allow for the same characteristics to be associated with better than average outcomes under supportive conditions in development. Either way, we know that one size does not fit all when it comes to early experiences, stress, and development.

Temperamental fearfulness or inhibition may be a critical dimension to monitor as a moderator of the impact on early adversity on stress neurobiology and later poor psychological and physical health outcomes. Children with this inhibited style of response exhibit higher cortisol and parasympathetic reactivity and more internalizing symptoms in response to harsh parenting (Sturge-Apple, Davies, Martin, Cicchetti, & Hentges, 2012). As noted earlier, it was the behaviorally inhibited children who responded with higher cortisol increases to child care that exhibited more internalizing symptoms over time (Gunnar et al., 2011). In addition, in a recent study of telomere length, shorter telomeres, which index greater cell gaining, were noted for those children who were more sympathetically and adrenocortically reactive to a laboratory challenge and showed more internalizing symptoms (Kroenke et al., 2011). Finally, in many laboratory studies of early stress, it was the more fearful, anxious children who exhibited elevations in cortisol in the context of insecure attachment relationships or poorer care quality, and who showed the strongest positive response to supportive care (Gunnar & Donzella, 2002). Thus, it seems likely that it is the children who are temperamentally more fearful and anxious who will exhibit the largest impacts on stress neurobiology and increased rates of anxiety and depression if exposed to toxic stress conditions early in life.

Implications for Policy and Practice

As we accumulate evidence of the neurobiological consequences of adverse early life care, it becomes more imperative that we identify and implement prevention efforts to reduce exposure to toxic stress conditions early in life and develop and deploy more effective interventions for children who have experienced these conditions (National Scientific Council on the Developing Child, 2011). Prevention and early intervention research is only just beginning to employ measures of stress physiology and neurobehavioral outcomes (Bruce, Martin McDermott, Fisher, & Fox, 2009; Dozier et al., 2006; Fisher & Stoolmiller, 2008). Such work holds promise for both increasing our understanding of the psychosocial processes that regulate the development of individual differences in stress reactivity and regulation, and illuminating the ways in which we can intervene to better regulate stress and enhance children's health and wellbeing.

Acknowledgment

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Neighborhood Effects and Young Children's Outcomes

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A substantial body of research over the past two decades has examined the impact of neighborhood characteristics on young children's outcomes. From the seminal work of Brooks-Gunn, Duncan, and Aber (1997) and the review by Leventhal and Brooks-Gunn (2000) much work in the area has confirmed that neighborhood effects, although small relative to family-level effects, have an impact on children's outcomes.

The outcomes most commonly examined have included verbal ability, cognitive skills, behavior problems, and school readiness for preschool-aged children (Benson & Borman, 2010; Brody et al., 2003; Carpiano, Lloyd, & Hertzman, 2009; Chase-Lansdale & Gordon, 1996; Curtis, Dooley, & Phipps, 2004; Dupéré, Leventhal, Crosnoe, & Dion, 2010; Lapointe, Ford, & Zumbo, 2007; O'Brien Caughy & Campo, 2006; Oliver, Dunn, Kohen, & Hertzman, 2007; Vaden-Kiernan et al., 2010) as well as behavioral and educational outcomes such as time spent on homework, math scores, standardized educational outcomes, and high-school graduation for school-aged children (Ainsworth, 2002; Greenman, Bodovski, & Reed, 2011; Hansen et al., 2011). Cognitive outcomes have generally shown more consistent associations with neighborhood characteristics than behavioral outcomes (Barbarin et al., 2006; Hansen et al., 2011; Kershaw, Forer, Irwin, Hertzman, & Lapointe, 2007; Kohen, Oliver, & Pierre, 2009;

Lapointe et al., 2007; Leventhal & Brooks-Gunn, 2000; Oliver et al., 2007), with neighborhood affluence being the neighborhood characteristic particularly relevant for positive outcomes.

Interestingly, findings from experimental studies conducted in the United States yield results that are somewhat inconsistent with the evidence that neighborhood affluence is the critical neighborhood feature that impacts child and youth outcomes. From the quasi-experimental Gautreaux program in Chicago to carefully designed randomized experiments such as the multisite Moving to Opportunity, studies have shown that moving residents from disadvantaged neighborhoods to more affluent ones does not necessarily lead to positive outcomes for children. In attempts to further understand the results of these experimental efforts, several researchers have examined what might explain the associations, and particularly the modest gains made by the children (Duncan, Brooks-Gunn, & Klebanov, 1994; Goering & Feins, 2003; Leventhal & Brooks-Gunn, 2011; Rosenbaum, 1995). These studies have also commented on the mechanisms by which neighborhoods manifest their effects on young children.

This chapter provides a review of this body of literature. We start by reviewing findings from the experimental studies. These provide a strong design for the impact of neighborhood and community features while controlling for compositional effects such as selection factors (i.e., people usually have some choice in selecting the neighborhood they live in), since it is difficult to separate these out in nonexperimental studies. We then continue with a review of other studies that have looked at explaining how neighborhood effects are manifested for young children. We conclude by presenting findings from studies conducted in a Canadian context to gain insights into future research directions.

Examples of Two Experimental Studies

The Gautreaux program was the first of such quasi-experimental neighborhood relocation programs, initiated by a court order in 1976 and ending in 1998. The program randomly assigned a total of 7,100 low-income Black families living in public housing in suburban or urban areas to relocate into private housing either in similar Chicago neighborhoods, or to middle-class suburban neighborhoods outside the city. Maternal reports of their children's grades and school performance did not differ for city and suburban movers. However, in a 10-year follow-up study, benefits were found for

children who moved to the suburbs compared to those who moved within the city, including a lower likelihood of dropping out of high school and a higher likelihood of attending college (Rubinowitz & Rosenbaum, 2000).

Neighborhood factors such as the impact of schools and children's social climate have been explored as explanatory factors for these results. Children who participated in the Gautreaux program reported initial difficulties in adapting to the higher expectations of suburban schools and thus received lower grades in the early years (1–6 years post move). However, suburban schools had a more advanced curriculum, with the city curriculum being several years behind (Rosenbaum, 1995), such that it is likely that in the early years children had to catch up and therefore did not demonstrate higher grades immediately. Suburban schools also had smaller classes enabling children to receive more help at school. Parents in the suburbs gave higher ratings of teacher and course satisfaction, and had better attitudes toward school, than parents in the urban communities. Thus, it is likely that the higher expectations of a more demanding curriculum were associated with poorer initial school performance but also gave children the opportunity to improve due to the additional availability of school resources.

This explanation was somewhat confirmed by follow-up data from administrative standardized test scores obtained from the Illinois Department of Education for all schools in the state. These showed that, on average, students at suburban schools had significantly higher reading scores and college admission test scores, suggesting higher standards in suburban compared to city schools (Rosenbaum, 1995). Social climate was also examined. For example, a higher proportion of children in the suburbs reported being called names; however, fewer reported being threatened. The majority of both groups (94%) were never hurt and positive social integration was reported by both. For example, each group of children reported similar numbers of friends.

While Gautreaux showed minimal benefits for children early on, longer term benefits emerged. For example, 22 years later two thirds of Gautreaux residents stayed in the suburbs (Keels, Duncan, DeLuca, Mendenhall, & Rosenbaum, 2005) and children who were old enough to live on their own continued to live in neighborhoods that had lower poverty rates, higher educational attainment, and were more racially integrated than their original neighborhoods.

The Moving to Opportunity Study (MTO) was another carefully designed experimental program from the U.S. Department of Housing and Urban Development that randomly assigned low-income, minority

families with children who were on public income assistance to various neighborhoods. Groups were either assigned to private housing in low-poverty neighborhoods, private housing in neighborhoods of their choice, or remained in public housing (Goering & Feins, 2003). Unlike Gautreaux, a "nonmover" comparison group was included. Results for children aged 6–10 years showed program effects for grade repetition, but contrary to the hypothesized direction. Children who moved to affluent neighborhoods, particularly boys, were more likely to repeat a grade than children in the control group. However, benefits of the MTO were reported for adolescent girls who moved to low-poverty areas: they obtained higher achievement test scores and higher rates of school enrollment and school completion compared to those who stayed in high-poverty areas (Kling, Liebman, & Katz, 2007). Other follow-up studies reported the benefits of moving to low-poverty neighborhoods for school-aged boys such as decreased anxiety and depressive symptoms compared to boys who did not move (Leventhal & Brooks-Gunn, 2003). However, evidence of the benefits for children and youth outcomes has been mixed (Leventhal, Fauth, & Brooks-Gunn, 2005; Orr et al., 2003; Sanbonmatsu, Kling, Duncan, & Brooks-Gunn, 2006).

The neighborhood factors that have been explored in MTO have gone beyond school and social climate to include neighborhood safety, parent stress and social support, and parenting behaviors. Similar to Gautreaux, younger boys, aged 6–10, who moved experienced more grade retention and repetition. Children who moved to the suburbs were more likely to be placed in special education classes than children who stayed in the city (Kling et al., 2007; Leventhal & Brooks-Gunn, 2004; Rubinowitz & Rosenbaum, 2000). In terms of the school environment, parents who moved to more affluent neighborhoods as part of the MTO reported greater satisfaction with the quality of their children's school than parents who did not move. Children were less likely to attend schools composed primarily of poor minority students, more likely to attend schools that their parents rated as safe, and were also marginally more likely to spend time on homework. Time spent on homework and school safety accounted in part for program effects on achievement (based on a 3-year follow-up of NY MTO, the site that collected child and adolescent outcome data (Leventhal & Brooks-Gunn, 2004).

Another possible explanation for the program effects on child outcomes are suggested by qualitative data reported by Popkin, Leventhal, and Weismann (2006) and Deluca and Rosenblatt (2010) who showed that, even if

families moved to more affluent neighborhoods, children did not necessarily change schools. All five MTO cities had school-choice programs, so some MTO families chose to remain in their original familiar schools and others chose schools that were close to relatives who could provide after-school care. Only a third of children changed schools when the families moved, and several were still attending schools in their original neighborhoods. Furthermore, findings suggested that a majority of mothers held the belief that the school's quality matters much less than child characteristics such as the child's inherent commitment to being a good student.

Social climate was also examined in the MTO study. Daughters who moved into better neighborhoods showed improvements on measures of delinquency, substance use, and risky behaviors compared to girls who did not move to affluent neighborhoods and this was partially explained by decreases in the frequency of peer contact (Clampet-Lundquist, Edin, Kling, & Duncan, 2006). For boys, however, social difficulties were reported, such as trouble fitting in and making new friends, and the challenges of finding things to do in their new suburban neighborhoods compared to their urban neighborhoods of origin (Clampet-Lundquist et al., 2006).

One of the incentives for participation in the MTO program, reported by the majority of parents, was to get away from negative neighborhood environments, drugs, gangs, violence, and crime (Goering et al., 1999; Kling, Ludwig, & Katz, 2005). Parents who moved to low-poverty areas did report less physical and social disorder, more satisfaction with their neighborhood, as well as less distress and depression, compared to control parents (Kling et al., 2007; Leventhal & Brooks-Gunn, 2003). While parental stress was reduced, their socioeconomic situation did not change. Parent employment, welfare receipt, and household income did not differ between the groups (Leventhal & Brooks-Gunn, 2003), and adults who moved into new neighborhoods reported less frequent informal contact with neighbors and experienced increased isolation compared to those who did not move. In terms of parenting behaviors, parents who moved to more affluent neighborhoods were harsher and provided more routines for their daughters than those who did not move (Leventhal & Brooks-Gunn, 2005). While participation in the MTO program demonstrated mixed results for children's outcomes, school and social climate appeared to have been important influential factors as well as impacts on parenting behavior, stress, and support. While socioeconomic differences were not apparent in the long term, other benefits emerged. Follow-up and further investigations

of these cohorts could still provide important insights into the impact of neighborhoods on families and children.

Based on results from experimental studies, some of the ways neighborhood effects could influence children's outcomes have been explored based on theories about the manner in which neighborhood effects manifest themselves (Jencks & Mayer, 1990; Shonkoff & Phillips, 2000; Wilson, 1987). Proposed theories have included: *contagion or epidemic theories*—stressing the importance of peers who play a role in spreading problematic or positive influences; processes of *social organization and socialization*—focusing on social control and the importance of role models, their values, and the manner in which children are parented; *stress theories*—suggesting that neighborhoods that are disadvantaged and unsafe are associated with increased stress and poorer parental mental health; and *neighborhood institutional resources*—focusing on the role that child care, schools, community centers, parks, and libraries may have on children's outcomes. Several research studies have considered mediated effects and sought to explain associations between neighborhood socioeconomic or structural features and child outcomes. This line of research points to the indirect influence of neighborhood effects, which impact child outcomes by influencing other factors. The following includes a brief review of some of these in an attempt to better understand the mechanisms of neighborhood effects.

Contagion or Epidemic Theories

Contagion or epidemic theories have suggested that children in disadvantaged neighborhoods have more opportunities to observe and participate in problematic behaviors. Because they have more exposure to aggressive models and more opportunities to directly interact with peer groups who exhibit such behaviors (Sampson, Raudenbush, & Earls, 1997), their social context can amplify risk. Evidence suggests that living in a disadvantaged neighborhood is associated with a greater likelihood of associating with deviant peers (Brody et al., 2001). In contrast, neighborhood collective socialization, involved, warm, and nurturing parenting, as well as parental monitoring have been shown to be protective factors for associations with deviant peers (Brody et al., 2001). However, when compared to the role of siblings, the role of neighboring children on child outcomes is minimal, particularly after family socioeconomic factors are accounted for. For example, reporting on data from the national longitudinal Panel Study of

Income Dynamics (PSID), Duncan, Boisjoly, and Harris (2001) found that best friends were more similar than grade mates or neighborhood peers, but siblings were the most similar in terms of their outcomes. These relationships held for a variety of outcomes including verbal achievement, educational attainment, and problem behaviors (Brody et al., 2003; Solon, Page, & Duncan, 2000), suggesting that neighborhood peers may not have a very strong influence.

Social Organization and Parenting

Social organization or "collective efficacy" refers to both the formal and informal institutional or control mechanisms in a neighborhood and the extent to which the community can realize residents' common goals and solve community problems. Community social resources have been described as including the presence of shared norms, mutual trust, and the willingness to intervene for the common good, particularly concerning child rearing (Sampson et al., 1997). For example, lack of social organization and collective efficacy has been associated with poorer supervision and monitoring of children and youth and unsupervised peer-group activities (Brody et al., 2001; Brody et al., 2003). Poor neighborhood socialization has been associated with problem behaviors such as public drinking, drug use, crime, and the destruction of property (Sampson & Groves, 1989). For young children, social organization can have an influence through the presence of role models and socializing influences for parents, informal relations between parents and children, and community resources. In the most extreme case, low levels of neighborhood socialization have been associated with child maltreatment (Coulton, Crampton, Irwin, Spilsbury, & Korbin, 2007; Molnar, Buka, Brennan, Holton, & Earls, 2003) but also with preschoolers' outcomes such as verbal abilities and behavioral problems (Kohen, Brooks-Gunn, Leventhal, & Hertzman, 2002).

In explaining how neighborhood social organizational processes manifest themselves on child outcomes, Kohen, Leventhal, Dahinten, and McIntosh (2008) showed that neighborhood socioeconomic or structural characteristics manifest effects on family processes and ultimately on child verbal and behavioral outcomes via processes of neighborhood cohesion. Furthermore, in a nationally representative sample of Canadian children, measures of neighborhood socioeconomic features and social cohesion were not highly correlated, suggesting that neighborhood poverty and social organization

do not necessarily reflect the same processes. Neighborhood disadvantage manifested its impact via neighborhood social cohesion, which, in turn, impacted parental mental health, family processes, parenting behaviors, and ultimately preschoolers' verbal and behavioral outcomes. Thus, the impacts of neighborhood social organization may operate via informal relations between parents within the neighborhood to oversee and protect their children as well as the number of adults available to serve as role models. For example, a neighborhood with good social organization would have adults modeling adaptive parenting behaviors and a community organized enough to influence the provision of institutional resources such as schools, libraries, parks, and programs to promote child development. Neighborhoods that lack social organization, on the other hand, are associated with environments that are less optimal for families and child rearing.

Parenting

Several studies have examined parenting behaviors as mediators of neighborhood socioeconomic effects, largely focusing on parental warmth, parenting that is positive and consistent, as well as parental control, monitoring behaviors, and cognitive stimulation. Neighborhood poverty and danger, and dissatisfaction with neighborhood services, have been associated with lower levels of parental warmth, less consistent discipline, and more harsh parenting behaviors (Pinderhughes, Nix, Foster, Jones, & The Conduct Problems Prevention Research Group, 2001). Perceptions of neighborhood violence have been associated with higher levels of parental monitoring (Jones, Forehand, O'Connell, Armistead, & Brody, 2005), and cognitive stimulation in the home has been shown to be an important mediator of neighborhood socioeconomic characteristics for preschool-aged children's outcomes (Klebanov, Brooks-Gunn, Chase-Lansdale, & Gordon, 1997; Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998; Kohen et al., 2008).

Additional research has demonstrated that neighborhood effects on parenting behaviors are mediated via neighborhood organizational processes, parental mental health, and family processes (Kohen et al., 2008). However, others have found social organization to be less important in this association (O'Brien Caughy & Campo, 2006). O'Brien Caughy and Campo (2006) found that neighborhood organization, or parents' willingness to intervene, as well as parent engagement in joint activities was positively associated with cognitive outcomes for a sample of African American preschoolers; however,

these factors did not mediate the negative effect of neighborhood poverty on young children's cognitive outcomes.

Studies have also shown moderator effects by which parenting behaviors have a different effect on child outcomes based on the neighborhood context. For example, harsh and restrictive parenting behaviors are associated with both academic and conduct outcomes, but these associations depend on the context or behaviors considered normative within the community. For example, Simons, Lin, Gordon, Brody, and Conger (2002) showed that caregiver control was related to fewer conduct problems in communities with low social deviance. But the impact of parental control decreased as antisocial behaviors within the community increased. Harsh and controlling parenting was associated with higher levels of child conduct problems in communities where such parenting behaviors were rarely exhibited, but no such associations were apparent in communities where harsh and controlling parenting behaviors were prevalent, suggesting that the associations of parenting behaviors and child outcomes vary by neighborhood, cultural context, and what is normative within the community. Moreover, Pinder-hughes and colleagues (2001) demonstrated a significant interaction such that the negative association between danger in the community and parental warmth shown for European American children did not hold for African American children. Similarly, Dearing (2004) found restrictive parenting to be associated with poor academic performance in low-risk neighborhoods but not in high-risk neighborhoods. Restrictive parenting was associated with higher academic performance for African American (but not European American) children living in high-risk neighborhoods. However, supportive parenting was also associated with academic achievement for African American children in high-risk neighborhoods but not low-risk neighborhoods. These findings suggest that the interplay of parenting behaviors, neighborhood characteristics, and child outcomes is complex and they need to be carefully considered together.

Stress Theories

Neighborhood disadvantage and impoverished living conditions have been found to be associated with increased stress, psychological distress, and poor mental health (Hill, Ross, & Angel, 2005; Latkin & Curry, 2003), which, in turn, impact child outcomes. Similar associations have been found for neighborhoods high in social disorder and crime, and low in

cohesion (Christie-Mizell, Steelman, & Stewart, 2003; Franco, Pottick, & Huang, 2010; Guttman, McLoyd, & Tokoyawa, 2005; Kohen et al., 2008; Kotchick, Dorsey, & Heller, 2005). Kohen and colleagues (2008) found low neighborhood social cohesion to be related to maternal depression and family dysfunction, which, in turn, were found to be associated with parenting behaviors which then impacted child outcomes. These associations demonstrate that neighborhood effects on child outcomes are influenced by parental mental health and family functioning.

While social support and community involvement have been shown to be protective for stress and poor mental health, this is another example where different effects are exhibited based on different contexts. Dupéré and Perkins (2007) found that isolation from neighbors in communities characterized by disorder and crime served as a protective factor for mental health, suggesting that, like parenting behaviors, coping strategies vary based on neighborhood and family factors. Similarly, Franco and colleagues (2010) found neighborhood social disorder and low cohesion to be associated with increased levels of parenting stress. However, the association was stronger for white mothers living in disordered neighborhoods compared to minority mothers, even though minority mothers lived in neighborhoods that exhibited more disorder and lower cohesion. While neighborhood context is associated with stress, minority parents appeared to demonstrate less stress than white parents in high disordered neighborhoods. However, as stated previously in findings from the MTO program, minority parents reported decreased stress when they moved to more affluent neighborhoods as well as better mental health (Leventhal & Brooks-Gunn, 2003; Orr et al., 2003).

Neighborhood Institutional Resources

The role of institutional resources such as schools and child care for young children within a neighborhood have not been extensively investigated, although they are particularly important for child outcomes. A handful of studies have examined the school as an institutional resource that may mediate the impact of neighborhood effects on school-related outcomes (Ainsworth, 2002; Brannstrom, 2008; Kauppinen, 2008; Kohen et al., 2009; Pong & Hao, 2007; Sykes & Musterd, 2011). In explaining the relation between neighborhood affluence (a composite of education and employment) and academic achievement, Ainsworth (2002) found that approximately 40% of the neighborhood effect was explained by

school-related variables, including homework, educational and occupational expectations, and school atmosphere. However, other studies looking at time spent on homework as a mediator of neighborhood affluence for school-aged children have been inconclusive, finding both positive (Leventhal & Brooks-Gunn, 2004) as well as no significant mediation effects (McCullogh, 2006; O'Brien Caughy & Campo, 2006).

Using U.S. national longitudinal data, Solon, Page, and Duncan (2000) reported more variability in outcomes within a neighborhood or school than between neighborhoods and schools. Moreover, the amount of variability explained by the school was greater for standardized and teacher-reported outcomes than for parent-reported outcomes. Kohen and colleagues (2009), using cross-classified hierarchical linear modeling, found that neighborhood characteristics explained a significant amount of the variability in a variety of teacher-reported preschoolers' outcomes over and above child- and family-level sociodemographic factors. While most of the variability in child cognitive and behavioral outcomes was found within child- and family-level factors compared to neighborhood factors, school had a substantial and significant effect, a finding that is in line with others (Brannstrom, 2008; Duncan et al., 2001; Teitler & Weiss, 2000). Unfortunately, the school characteristics that have been examined are limited (see Nettles, 1991 for a review).

Recent work also provides evidence that the effect of neighborhood socioeconomic factors on youth standardized achievement tests was completely mediated by the school environment while neighborhoods still accounted for an additional portion of variance in achievement after considering family factors (Sykes & Musterd, 2011). Other international research (Kauppinen, 2008) found that school structure was an important link between neighborhood factors and educational outcomes such as educational aspirations and standardized tests. When school variables (e.g., socioeconomic factors and ethnic minority composition) were added into a cross-classified model (accounting for children living and attending schools in different neighborhoods), the effects of neighborhood no longer explained a significant portion of the variance in achievement. It is also noteworthy that the authors failed to find any moderating effects of neighborhood and school, suggesting that attending a high-socioeconomic school does not buffer the effect of living in a disadvantaged neighborhood.

Even less consideration has been given to the child-care environment as an institutional mechanism mediating neighborhood effects for young children. However, a study by Dupéré and colleagues (2010) found that

child care was an important neighborhood institutional mechanism by which neighborhood advantage influenced child vocabulary and reading scores, suggesting the importance of the child-care environment as an institutional resource. In fact, child and school environments (along with the home environment) accounted for approximately one third of the neighborhood effect.

While neighborhood socioeconomic factors have not been shown to predict the type of child care chosen by parents after controlling for family characteristics, neighborhood process may influence parents' choices (Burchinal, Nelson, Carlson, & Brooks-Gunn, 2008). For example, non-relative care was more likely than parental care and center-based care when community social organization was high. However, quality of child care was found to be lower in socioeconomically disadvantaged communities. Lack of research in this area may be due to the difficulty in obtaining data for community characteristics as well as for children who participate in various forms of child care and also due to the variability of children attending daycares or community schools both in and outside their neighborhoods of residence. However, recent methodological advances have allowed for the examination of these effects.

Sophisticated methodological techniques such as hierarchical linear modeling (HLM) have become more common in the neighborhood research literature to analytically account for the nested nature of neighborhood effects (Carpiano et al., 2009; Kohen et al., 2009; Lloyd, Li, & Hertzman, 2010; Oliver et al., 2007; Romano, Tremblay, Boulerice, & Swisher, 2005). A review of studies using HLM (Sellstrom & Bremberg, 2006) confirmed that neighborhood effects emerge even when multivariate modeling (HLM) techniques are used that control for shared variance within a neighborhood, concluding that up to 10% of the variance in child outcomes can be explained by neighborhood effects. HLM techniques, however, have the additional advantage of allowing researchers to examine cross-classified random effects (Leyland & Goldstein, 2001; Raudenbush, 1993), accounting for the fact that, for example, children attend schools both in and outside of their residential neighborhood and that children within a school come from different neighborhoods (Edwards & Bromfield, 2009). HLM has also been used to examine nonlinear effects, suggesting a "tipping-point" for which the number of affluent families in a neighborhood may no longer confer additional advantages (e.g., Dupéré et al., 2010; Lloyd & Hertzman, 2010). For example, Carpiano, Lloyd, and Hertzman (2009) found that preschool children's teacher-rated competencies improved with increasing

heterogeneity in a neighborhood, as opposed to increasing in a linear pattern whereby child outcome scores would increase as the neighborhood became more affluent. These findings suggest that neighborhood mix may be advantageous and point to the need for further theoretical inquiry examining mediators of nonlinear effects.

Neighborhood Research in a Canadian Context

In Canada, the neighborhood research that has been conducted reflects a somewhat different context. Socioeconomic disparities have been shown to be greater in U.S. as compared to Canadian cities (Ross et al., 2005), and neighborhood poverty is not as concentrated. In addition, in the United States a large part of the research body of work in this area has focused on ethnic minority, such as African American and Hispanic, children, often confounding poverty and other issues—cultural differences, racism etc. (Brody et al., 2003; Goering et al., 1999; Guttman et al., 2005; Kling et al., 2005). US-based research on African American communities often lacks an adequate representation of middle-class and affluent families, although several studies have included ethnic minority participants living in varied socioeconomic conditions (Brody et al., 2001; O'Brien Caughy & Campo, 2006). Research in the Canadian context has extended findings beyond African American and Hispanic subgroups as studies have focused on immigrant groups as well as Aboriginal people (Findlay & Kohen, 2012; Georgiades, Boyle, & Duku, 2012; Kohen & Oliver, 2010).

Canadian immigrants are heterogeneous, coming from different countries of origin including Europe and Asia and differing in maternal language (Statistics Canada, 2008d). They may or may not include visible minorities and often include individuals with high levels of education from their country of origin (Statistics Canada, 2006). Despite this, upon arrival in Canada many do not work in their trained professions and may have poorer economic outcomes (Bonikowska, Hou, & Picot, 2011). Immigrants are an interesting group, as they may be highly educated but do not necessarily attain economic gains in the host country. When the percentage of immigrants in the neighborhood is examined as a neighborhood characteristic, negative associations have been found with language-dependent outcomes such as verbal abilities (Oliver et al., 2007), but positive associations have been found for measures that are not language-dependent (Kohen et al., 2009). For a variety of preschool outcomes, Kohen and colleagues found that

the percentage of immigrant families in the neighborhood was associated with poorer verbal abilities and higher ratings of anxiety and aggression, but also higher developmental scores. Furthermore, over time, Canadian children of immigrant families have been shown to have lower behavioral and emotional problems and higher school achievement than nonimmigrant children (Georgiades et al., 2012).

Aboriginal peoples make up demographically distinct groups in Canada (Statistics Canada, 2008b; Statistics Canada, 2008c). They represent a young and fast-growing demographic in the Canadian population, yet face the most disadvantaged sociodemographic conditions and have lower high-school completion rates (Statistics Canada, 2008e) and suicide rates higher than the Canadian population (Oliver, Peters, & Kohen, 2012; Tjepkema, Wilkins, Senécal, Guimond, & Penney, 2009). The Aboriginal community environments have been an area of research in Canada with a focus on socioeconomic conditions generally, as well as housing conditions in particular (e.g., housing in need of repair, crowding, and remoteness (O'Sullivan & McHardy, 2007; White & Maxim, 2007). While studies exist documenting the living conditions of Canadian Aboriginal people, very few empirical studies have documented the associations of neighborhood conditions for Aboriginal children's outcomes.

Two studies examining the associations of neighborhood characteristics and young Aboriginal children's outcomes have been conducted using data from a large-scale nationally representative study of Canadian Aboriginal children, the Aboriginal Children's Survey (Statistics Canada, 2008a). Following other neighborhood research, these studies have examined associations with census-linked neighborhood socioeconomic features and parent-reported measures of social organization and children's language and behavioral outcomes (as assessed by the parent-reported Strength and Difficulties Questionnaire, see Goodman, 1997; Kohen & Oliver, 2010; Oliver, Findlay, McIntosh, & Kohen, 2009) as well as children's language outcomes (Findlay & Kohen, 2012). These studies have shown associations between neighborhood socioeconomic and neighborhood organizational features with both verbal and behavioral outcomes.

In one such study using data from the Aboriginal Children's Survey, neighborhood safety, community involvement, and the perception of community facilities were associated with positive parent behavior ratings (Kohen & Oliver, 2010). Although features of social organization were associated with each of the behavioral subscales examined (prosocial, emotional, hyperactivity-inattention, conduct problems), these were largely mediated

by family-level factors (with few exceptions, e.g., social organization for prosocial behaviors and institutional resources for prosocial and emotional behaviors were not mediated by family factors). An interesting finding that emerged from these studies was the importance of neighborhood education (percent with high school or greater) for child outcomes rather than neighborhood affluence. Previous work has not shown strong associations for neighborhood education with child outcomes for children living in the general population (Kershaw et al., 2007; Lapointe et al., 2007). However, in these studies focusing on Aboriginal children, once family-level socioeconomic factors were considered, neighborhood characteristics were no longer significantly associated with preschool behavioral and verbal outcomes (Findlay & Kohen, 2012; Kohen & Oliver, 2010).

Another neighborhood characteristic that has largely been ignored, but is particularly relevant for Aboriginal as well as non-Aboriginal children, is the presence of culture both in the neighborhood and in the home. Although not based on Canadian data, Caughy and colleagues (Caughy, O'Campo, Randolph, & Nickerson, 2002) provide one such example, showing that a home environment rich in (African American) culture was associated with children's better problem-solving skills and knowledge. Findlay and Kohen (2012) have also included this characteristic demonstrating the positive association between Aboriginal cultural activities in the neighborhood and children's language outcomes. The importance of neighborhood and family cultural activities should be an area of further exploration.

Conclusions

The neighborhoods children live in have been shown to be important, having both direct and indirect effects mediated by a variety of other factors. Early theories and findings from experimental work have led to several studies exploring the manner in which neighborhood effects are manifested on child outcomes. Sophisticated analytic methods have allowed gains to be made in our understanding of the complex interplay of neighborhood socioeconomic as well as other neighborhood features and the processes implicated in influencing child outcomes. These have only begun to be used and more applications to various data sources including international data would be informative.

An area that needs closer attention is the examination of "latent effects," whereby benefits may not be apparent immediately but may emerge over

time, as suggested by the experimental and other studies reviewed here. This points to the necessity of collecting longitudinal data on a variety of neighborhood conditions, mediating processes at the institutional as well as family level, and outcomes. Another area of potential exploration is in the area of biological or neurological impacts that may occur as a result of different contextual or environmental influences (Raisada & Kishiyama, 2010). While the impacts of living in different neighborhoods have been documented in terms of behavioral outcomes, less information is available about how these may impact biological or neurological processes which may also contribute to our understanding of latent neighborhood effects on child outcomes.

While numerous studies exist documenting the impact of neighborhood factors on child outcomes and the processes by which these effects are manifested, findings are not conclusive, in part due to studies based on select samples largely based on U.S. data. Further research is needed on different and varied neighborhoods, families, and children to extend the generalizability of results. In addition, the volume of existing research calls for systematic review studies to be conducted in this area of research. These could be undertaken to determine effect sizes of different neighborhood characteristics—for example, the impact of neighborhood affluence compared to neighborhood education—and could also be used to examine effect sizes for different outcomes such as cognitive or behavioral outcomes. Within a systematic review, tools such as study quality and outcome quality measures could also be used to inform results and future work. Systematic reviews are a comprehensive way to synthesize existing findings, provide directions for future research, and act as powerful sources of evidence to inform policy.

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18

The Family Check-Up

A Tailored Approach to Intervention with High-Risk Families

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Overview

The link between problem behavior in early childhood and more serious problem behavior in later childhood and adolescence has been well documented (Huesmann & Eron, 1992; Loeber & Dishion, 1983; Moffitt, Caspi, Harrington, & Milne, 2002; Reinke & Petras, 2008; Shaw & Gross, 2008). Children who demonstrate a persistent course of problem behavior in early childhood are more likely to develop serious externalizing, internalizing, or comorbid problems during the school-age period and beyond, extending into adulthood (Moffitt & Caspi, 2001; Shaw & Gross, 2008).

There are several risk factors that account for the emergence of problem behavior in early childhood including poverty, stress, and parent mental illness and substance use (Aguilar, Sroufe, Egeland, & Carlson, 2000; Henry, Caspi, Moffitt, & Silva, 1996; Shaw, Gilliom, Ingoldsby, & Nagin, 2003).

However, at the core of the risk process are parent–child interactions associated with the amplification of problem behavior. In particular, coercive family interactions between the child and caregiver are associated with increased risk for early onset problem behavior and problem maintenance (Patterson, 1982; Patterson, Reid, & Dishion, 1992). Coercive interactions between the parent and child create a cycle of negative reinforcement and a family environment in which members use aversive behavior to control or change the behavior of the other. Initially, children may be the victims of harsh parenting, but eventually they adapt by engaging in the coercive process themselves, through the use of tantrums or other coercive strategies. When children "win" in these early coercive exchanges they lose in the long run, on so many levels: from the lack of prosocial skills to increased risk for delinquent behavior and so on. Eventually, parents give up their efforts to socialize their child, and ultimately disengage from parenting by early adolescence (Dishion, Nelson, & Bullock, 2004). Without adequate parental involvement, high-risk youth then self-organize during adolescence into peer clusters in which problem behavior is the venue of interaction, and increases in antisocial behavior, high-risk sexual behavior, drug use, and even violence may ensue (Dishion, Ha, & Véronneau, 2012; Dishion & Patterson, 2006).

In this sense, there is a need to support parenting practices from early childhood through adolescence across the range of risk ecologies. In Weisz and Kazdin's (2010) volume on empirically based intervention practices, a majority of the interventions for youth problem behavior include a strong emphasis on supporting family management (parenting) practices. Treatments that focus on supporting family management reduce oppositional defiance in early childhood (Zisser & Eyberg, 2010), middle childhood (Forgatch & Patterson, 2010), and adolescence (Henggeler & Schaffer, 2010; Liddle, 2010; Smith & Chamberlain, 2010; Waldron & Brody, 2010) and make this emphasis critical for effective intervention.

From a public health perspective, there is a need for parenting interventions that fit within the service delivery milieu that can engage the broad stream of children and families (Hoagwood & Koretz, 1996; Kazak et al., 2010). The Family Check-Up (FCU) is one such empirically supported intervention. The FCU was specifically designed to address child problem behavior at periods of developmental transition, such as toddlerhood and adolescence, among families experiencing multiple types of family and socioeconomic adversity (Dishion & Stormshak, 2007; Dishion et al., 2008; Shaw, Dishion, Supplee, Gardner, & Arnds, 2006).

The FCU is similar to other family-centered interventions that have established a solid empirical base for reducing child problem behavior (e.g., Brody et al., 2004; Conduct Problems Prevention Research Group, 2002; Webster-Stratton & Taylor, 2001). However, the FCU takes this method to a new and innovative level by providing a family-centered intervention that is brief, assessment-driven, and tailored to each family's unique ecology. As a preventive intervention, the FCU can be applied to many developmental periods and multiple types of child problem behavior. The purpose of this chapter is to discuss its usefulness for intervening in early childhood, while keeping in mind that the adaptability of this model allows for its effective application across clinical domains, developmental stages, and service implementation systems.

The design of the FCU by Thomas Dishion (Dishion & Stormshak, 2007; Dishion et al., 2008) was motivated by three principles: (a) that effective intervention for problem behavior in children and adolescents must be family-centered and ecologically focused; (b) that, in order to have long-term impact, interventions need to be brief, cost-effective, and embedded in existing service systems; and (c) targeting developmental transition points such as toddlerhood, school entry, and early adolescence maximizes the opportunities for change and risk reduction because child and family behaviors reorganize at these points (Dishion et al., 2008; Dishion & Stormshak, 2007; Sameroff & Fiese, 1987).

Essentially, from the beginning the FCU was designed to be family-centered, ecological, brief, and targeted toward key developmental transitions. For implementation in early childhood, the FCU was adapted to address the normative challenges parents face during the "terrible twos," particularly in high-risk environments where these normative challenges are more likely to lead to negative outcomes (Dishion, Véronneau, Stormshak, & Kavanagh, in press; Shaw et al., 2006). This chapter will describe the FCU in greater detail after outlining support for its effectiveness.

Empirical Support

The empirical base for the FCU in early childhood is grounded in two independent samples of 2-year-olds recruited from Women, Infants, and Children Nutritional Supplement Program (WIC) clinics at urban, rural, and suburban sites and further screened on the basis of socioeconomic, family, and child risk. Participants were randomly assigned to receive the FCU or WIC services as usual. The FCU has established empirical support for its

efficacy in improving multiple types of problem behavior and achieving these gains primarily through the improvement of parenting practices (Dishion et al., 2008; Shaw et al., 2006). The first trial included boys in an urban community and showed that, with only one dose of the FCU at age 2, intervention effects were found 1–2 years later: children's conduct problems decreased and parental involvement and positive parenting increased (Gardner, Shaw, Dishion, Supplee, & Burton, 2007). In addition, 2-year effects on reduction of conduct problems were reliably found for the highest-risk parent–child dyads, those with high levels of maternal depression and child fearlessness at age 2.

The second trial, the Early Steps multisite study, includes 731 male and female toddlers from rural, suburban, and urban communities and has included repeated doses of the FCU. Consistent with the emphasis on a health maintenance model, repeated doses of the FCU have resulted in intervention effects that have impacted a broader set of domains. During the preschool period, these have included improvements in children's conduct and emotional problems as well as co-occurring problem behavior (Connell et al., 2008; Dishion et al., 2008; Shaw et al., 2009), inhibitory control, and language development (Lunkenheimer et al., 2008). The effects on conduct problems were most pronounced for children with the highest initial levels of conduct problems (Dishion et al., 2008). Corroborating findings from the initial study, the FCU resulted in improvements in positive parenting and, in addition, improvements in maternal depression, both of which were found to mediate improvements in children's conduct and emotional problems.

The effects of the FCU on child problem behavior appear to endure into the early school years with teachers reporting fewer oppositional problems and fewer conflicts with children in the intervention group compared to children in the control group at age 7.5 (Dishion, Brennan et al., in press; Sitnick, Shaw, & Hyde, 2014), and parents reporting faster growth in inhibitory control (Chang, Shaw, Dishion, Gardner, & Wilson, 2013). Effects on teacher reports of children's oppositional behavior at 7.5 are displayed in Figure 18.1, which demonstrate that reduced levels of oppositional behavior at school are mediated by earlier reductions in oppositional and aggressive behavior at home from ages 2 to 5 (Dishion, Brennan et al., in press). For parents showing improvements in positive parenting between ages 2 and 3, intervention effects also have been found for children's academic achievement at age 7.5. Given the disruptive effects of early problem behavior and poor parenting on milestones of normative development, it is relevant to point out that, although the FCU did not directly target the
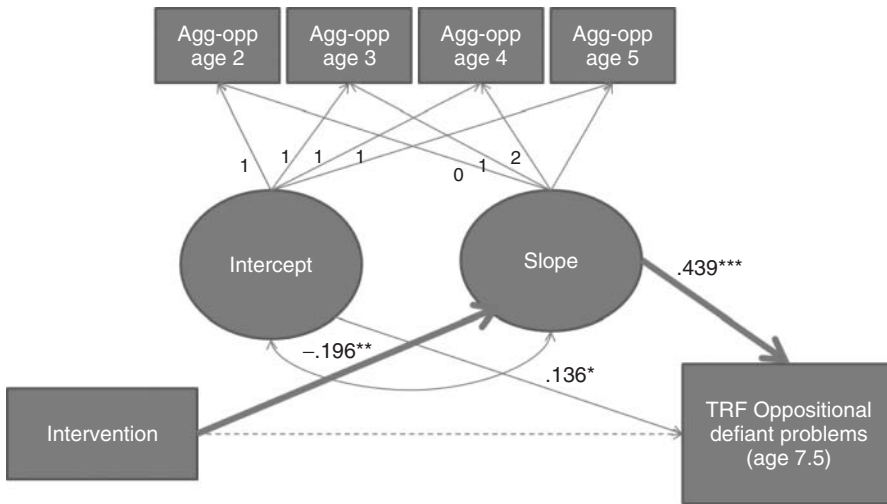
Figure 18.1.   Intervention and Control Group Differences in the Growth of Child Problem Behavior from Ages 2 to 7.5.

domains of language and cognitive development, improvements were found in both of these domains, linked in both cases to previous improvements in positive parenting (Brennan et al., 2013; Lunkenheimer et al., 2008).

Key Components of the Family Check-Up Model

Efficient and effective models that can be integrated within existing service models, such as pediatric offices, community mental health clinics, schools, and other public health venues are in high demand. The FCU is one such model, as it represents a synergy of key components designed to maximize effectiveness. The key components of the FCU that differentiate it from standard clinical care are: (a) it is assessment-driven and tailored to each family's needs, (b) it is relatively brief, averaging 3–6 sessions, (c) it utilizes a health-maintenance model, (d) it is strengths-based, and (e) it addresses issues of motivation. The FCU consists of three structured sessions (see Figure 18.2) that weave in these components; the first is a rapport-building initial interview, in which the clinician and family explore areas of concern and wellbeing. The second session is the comprehensive family assessment. The third is a feedback session during which the clinician discusses the results of the assessment and initial interview with attention focused on
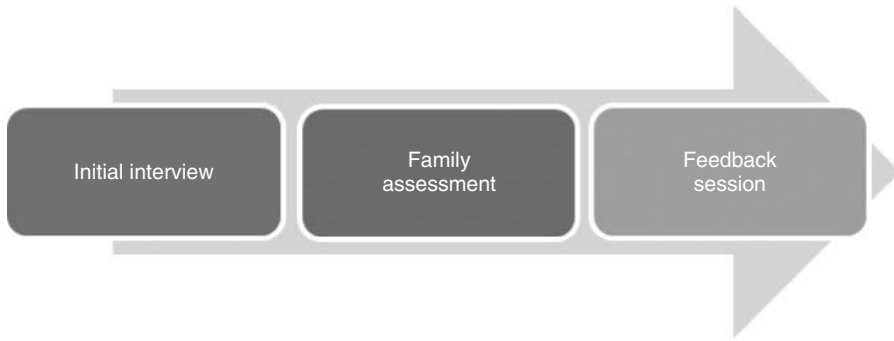
Figure 18.2. The Family Check-Up.

the caregiver's concerns and readiness to change culminating in a menu of treatment options (Dishion & Stormshak, 2007). These initial three sessions are followed by tailored intervention services to address family goals, which typically focus on improving parenting skills. However, when working with extremely high-risk families, follow-up sessions also can address contextual factors, including caregiver mental health, the management of life crises (such as imminent homelessness, lack of food), and family organization.

Assessment-driven.   The FCU derives much of its power from its ecological assessment (Gill, Hyde, Shaw, Dishion, & Wilson, 2008). The comprehensive assessment is the cornerstone of the intervention, as it emphasizes learning about both proximal and distal factors in the ecology of the child and family. The FCU assessment is multidimensional and addresses child and family functioning across multiple domains, for example, home, neighborhood, and preschool, using a variety of assessment methods. The assessment component is also highly adaptable, with the provider able to tailor the instruments and foci. The comprehensive assessment informs the feedback session of the intervention, providing detailed information about domains of child (e.g., negative emotionality, child behavior problems), family (e.g., parental depression, marital quality), and community-level (e.g., neighborhood dangerousness) risk factors that past research has linked to the development of early-onset conduct problems (Campbell, Shaw, & Gilliom, 2000; Shaw et al., 2003).

The central role that parenting practices play in a child's healthy development is becoming clearer, as is the role that poor parenting practices have in the early onset and maintenance of child problem behavior. As such,

parenting practices are a natural target for assessment and intervention, revealing themselves to be one possible mechanism of change (Gardner et al., 2007; Shaw et al., 2006). And so the FCU is "ecological" in its integration of a multimethod assessment of parenting practices across home and outside-of-home settings. Hence, there is a primary focus on evaluating caregiving practices through direct observation of parent–child interaction. In the case of the FCU for toddlers, this aim is accomplished by having parent–child dyads participate in a series of tasks, structured (e.g., a clean-up and teaching) and semi-structured (e.g., preparing a meal and serving it to the child). While we know that negative and neglectful parenting practices in toddlerhood predict later child behavior problems, we also know that child outcomes are the result of multiple factors, among which are child and family genetic factors, child temperament, social and economic context, and parental adjustment, to name only a few (Dishion et al., 2008). These multiple factors underscore the importance of the FCU's broad-based assessment component. This comprehensive assessment is what allows the intervention to be tailored very specifically to child and family needs, strengths, ecological variables, and contextual factors.

Brief intervention.   In line with the origins of the FCU model, the intervention process is relatively brief. The brief nature of the intervention is relevant because this is what allows the model to be implemented in a cost-effective manner and increases its adaptability to many different service systems (e.g., school, hospital, community family clinic, etc.). In the early childhood application of the FCU, the average rate of family engagement has ranged from 73% to 92%, with engaged families receiving an average of 3–4 sessions, with no "dose" effect for improvements in child behavior and caregiver wellbeing (Dishion et al., 2008; Shaw et al., 2006). This lack of a dose effect speaks to the power of the three structured sessions to motivate caregivers and families in a variety of ways—to improve parenting practices and to involve children in other supportive services.

Health maintenance approach.   The third key component of the FCU, the health maintenance approach, explicitly promotes periodic contact with families (i.e., yearly) over the course of key developmental transitions (Gill et al., 2008). Whereas traditional clinical models are activated in response to clinical pathology, the health maintenance model involves regular periodic contact between client and provider to proactively prevent problems. Examples of health maintenance models include the use

of semi-annual cleanings in dentistry and well-baby check-ups in pediatrics (Gill et al., 2008). This health maintenance approach also supports the brief nature of the model and directly impacts the next key component, an emphasis on strengths.

Strengths-based.   The FCU is deliberately strengths-based. At every step of the intervention, attention is drawn to the child's and family's strengths and areas of positivity. This is also a departure from the standard clinical model, with its emphasis on problem definition and labeling. The strengths-based approach of the FCU is intentional, in that the assessment is carefully designed to elicit strengths and clinicians are directed to fully explore areas of healthy functioning. Furthermore, clinicians implementing the model report that a strengths-based approach has a powerful and positive impact on caregivers, as many parents report having learned or heard about something they are doing well for the first time. The exploration and acknowledgment of strengths is also managed strategically, with the clinician considering how the unique strengths of a particular family and child can be capitalized on in the service of the changes they desire to make.

Motivational enhancement.   The FCU utilizes elements of motivational interviewing (MI) to facilitate change, which is the last key component of the FCU that sets it apart from many other family-centered interventions. The MI component is based on Miller and Rollnick's work (2002) using the Drinker's Check-Up, in which assessment data regarding the negative consequences of alcohol abuse on an individual's work and family life are shared in a feedback interview with clients. This approach is a cost-effective alternative to the standard inpatient treatment, often lasting up to 28 days, for reducing problem drinking in adults (Miller & Rollnick, 2002). When working with families of young children, the feedback session is designed to enhance parent motivation for changing problem behavior in their child, which is often achieved by modifying parenting behavior or contextual factors that compromise parenting quality (Forgatch & Patterson, 2010; Gill et al., 2008). The elements of MI have been incorporated into the FCU model to enhance engagement with family management interventions. In one study implementing the FCU with parents of adolescents, Connell, Dishion, Yasui, and Kavanagh (2007) found motivational interviewing to be the key factor in differentiating between adolescents who showed significant reductions in substance use and antisocial behavior and those who did not, which underscores the value of attending to the role of motivation in family management intervention.

The Initial Interview, Family Assessment, and the Feedback Session

Initial Interview

The initial meeting with caregivers is an opportunity for the clinician to build rapport and to begin to create a shared perspective about the child's behavior and family context (Dishion et al., 2011). The first session is usually held in the family's home, but can easily take place in a school or clinic setting. The initial interview focuses on developing a collaborative framework for subsequent intervention activities (Dishion & Stormshak, 2007) by emphasizing rapport building and exploring concerns and strengths with respect to parenting and the family context. Caregivers are invited to provide information about family resources (e.g., help of extended family members, strong marital relationship) and challenges (e.g., unstable housing, incarcerated father), so by the end of this visit caregivers have discussed their concerns and perceptions about their family and child and have revealed their motivation for change. The clinician works to ensure that caregivers feel understood and clarifies discrepancies between the caregiver's goals and current family functioning. Finally, the clinician invites family questions about the FCU intervention process and describes the purpose of the assessment and feedback sessions. The clinician shares how the information gained in the comprehensive assessment will be used to review and address the caregiver's identified concerns. For example, given a concern about noncompliance and temper tantrums, the clinician reviews the assessment with attention to specific strategies that might help improve the cooperation between caregiver and child (Gill et al., 2008). And although the structured assessment session follows the initial interview, sensitive and exploratory assessment happens during every phase of the FCU, including the initial interview and follow-up sessions.

The Assessment of Child and Family

The second session in the FCU, the comprehensive assessment, typically takes place in the family's home. Home-based assessment provides a rich environment for learning about the family and their broader context; however, based on provider needs, the assessment also can be conducted in the office or school. In recent years, there has been increased emphasis on the value of home-visiting programs, and the quality of information that

can be gained in the home setting should not be underestimated. The assessment session of the FCU is organized by three central theoretical domains: (a) family management, (b) sociocultural contexts and resources, and (c) problem behavior at home and in alternate care settings (Gill et al., 2008). Careful attention is given to selecting measures that could provide useful information in each of the aforementioned domains. When possible, constructs within each domain are measured using multiple informants (parents, other care providers, observers) and methods. This type of assessment provides a wealth of information about child behavior, parenting skills, family dynamics, context, and life stressors; it also sets the stage for the therapeutic contact between caregivers and clinicians.

The typical FCU assessment session includes a battery of questionnaires about child and family functioning, as well as a series of observational tasks. Ideally, assessment involves a balance of standardized questionnaires and observational measures, although all aspects of the assessment can be customized based on the goals of the provider and the needs of the family. For instance, if, during the initial interview, the family shares a concern that their child may have a developmental delay, the provider can add an assessment tool to further explore this possibility. In another example, a mother may share information indicative of domestic violence during the initial interview, and in this case the clinician can include an assessment tool focused on interpersonal relationships and conflict management. Additionally, our investigative team has developed a parenting measure called "Parenting Young Children" (PARYC) (McEachern et al., 2012). The PARYC includes scales for relevant domains of caregiving (e.g., proactivity, involvement, positive behavior support) as well as desire for change across these domains, which has been reported by clinicians to have great utility when discussing parenting practices in the feedback session.

Observational assessment may be new for many clinicians; however, the experience of training clinicians in the model suggests that a short series (2–3) of brief tasks can be easily learned. The quality and type of data gained from the observational assessment of parent and child interaction is often the most dynamic, revealing, and powerful information shared during the feedback session. Furthermore, studies have shown that the use of videotape feedback in parenting interventions is clearly associated with greater treatment effects. All of the data from the comprehensive assessment is shared with families in the feedback session, with the aim of enhancing their motivation for change.

Feedback Session

Preparation for the feedback session begins with a careful case conceptualization, based on the integration of data from multiple sources: the initial interview, questionnaire data, and the observational tasks. Clinicians carefully review the assessment data and consider where this family falls in relationship to national and culturally relevant norms. These data are considered within the frame of caregiver concerns, child and family strengths, level of motivation, and developmental and life-cycle stage. Ideally, the clinician generates an organizing theme for the feedback session and a focus that allows for the careful tailoring of information designed to heighten caregiver motivation for change (Dishion & Stormshak, 2007). The case conceptualization is represented on a Child and Family Profile, which is a visual aid for presenting the family with their concerns and strengths in various domains (see Figure 18.3).

The feedback session itself represents a respectful and transparent vehicle for sharing information with families. As with the other sessions in the FCU, the feedback session takes place either in the family's home or school or clinic setting. Family change is approached in a realistic, step-wise fashion, focusing first on issues of safety and security, then moving to issues of behavior management, parenting skills, and relationship building (Gill, et al., 2008).

The feedback session begins with a brief inquiry into the caregiver's perspective about their child. This is called the "parent self-assessment" question, and provides the caregiver with an opportunity to share his or her view from the outset, making it clear that his or her voice is of value in this process. Beginning with the parent self-assessment also provides the clinician with a quick look at the parent's current concerns as well as his or her capacity to reflect about their child. The clinician then shares a blank child and family profile with caregivers to orient them to the process for the meeting (see Figure 18.3). A brief description is given for the broad profile areas: child wellbeing and behavior, family wellbeing and support, and family management strategies.

Once the caregivers are oriented to the task at hand, the clinician shares the completed profile. A completed profile might look something like what you see in Figure 18.3. Areas of child and family strengths are indicated by stars in the 'Strength' range, while problem areas are indicated by a star in the 'Needs attention' range. This profile provides caregivers with a valuable visual tool to see how they and their child are doing. Presenting

Child wellbeing and behavior

Child temperament	☆
Child emotional wellbeing	☆
Child behavior	☆
Language development	☆

Strength　　　　　　　　　　　　　Needs attention

Family wellbeing and support

Emotional wellbeing	☆ Dad　　　Mom ☆
Significant other relationship	☆
Neighborhood and social support	☆
Financial stress	☆
Other:	

Strength　　　　　　　　　　　　　Needs attention

Family management

Incentives/encouragement	☆
Setting limits	☆
Proactive parenting	☆
Relationship quality	☆

Strength　　　　　　　　　　　　　Needs attention

Figure 18.3. Child and Family Profile.

the information in this way also allows the clinician to highlight connections between domains. For example, in Figure 18.3, the clinician would want to draw attention to the positive relationship between caregivers and the child, to the child's on-target language development and emotional wellbeing. On the other hand, based on caregiver report and observational data, the child is demonstrating some significant behavior problems—perhaps tantrums and oppositional or aggressive behavior—which can be tentatively linked to the areas of limit setting and proactive parenting that caregivers indicated need more skill development. Sections of the observational tasks are typically shared with the parent as a means to highlight parenting strengths as well as child or parent areas of concern. The use of videotape during the feedback session allows for the parent–child interaction to speak for itself. For example, parents can be profoundly moved when they notice the power of their positive attention. And viewing their child in a full-blown temper tantrum or seeing the coercive cycle in action on tape can be very

elucidating for both parent and clinician. Integrating the data from all sources can catalyze caregivers toward making changes.

As mentioned, the provision of feedback involves a delicate balance between reporting the facts about strengths and problems as well as building motivation for change, all the while being mindful of maintaining rapport with caregivers. The emphasis on strengths builds rapport with the family while encouraging the maintenance of positive behaviors. The feedback session is a highly collaborative process, one in which the clinician delivers the factual information from the assessment and frequently checks in with parents about their perspectives. While sharing information on the child and family profile, the clinician asks caregivers, "Does this information fit with how you see your child?" followed up with "Where do you see this area?" when caregivers view the situation differently than is represented on the profile. The feedback session invites a balance of clinician and caregiver talk for a thorough exploration of issues, strengths, and so on. Statements about problem areas are framed in a way that reflects the current research findings and, in doing so, grounds the information in a meaningful way for parents. The clinician tailors the feedback material so that it takes into consideration the contextual factors of the family, including cultural values, child development, family structure, socioeconomic status, and community and neighborhood factors.

At the end of the feedback session, the clinician provides a summary of its highlights, carefully reflecting back to the caregivers any change talk statements they made and highlighting strengths and areas of concern with the aim of motivating change. This summary is followed by a semistructured invitation for the caregivers to set goals for their child, their family, and themselves. Through the clinician's careful and strategic summary, family-based intervention options are primed to set goals relevant to areas of concern regarding their child. The clinician carefully records the parent's goals in their own words, with some guidance to create goals that are meaningful and realistic.

At this point, the clinician discusses a menu of family-based intervention options with the caregivers. The intervention options stem from previous work using the FCU and focus groups with parents (Dishion & Stormshak, 2007), and include (a) monthly to weekly follow-up support, either in person or by phone, (b) assistance with specific child behavior problems or parent issues, (c) parent management training, (d) preschool/day-care consultations, and (e) community referrals. The clinician encourages caregivers to choose the level and type of services that best meet the family's needs.

The FCU provides options for intervention emphasizing services that focus on parenting skills and family management practices. The core of follow-up intervention addresses parenting practices and family management issues; however, the clinician can provide referrals for problems outside of parenting (e.g., language development) or work with families on these issues depending on his or her expertise (e.g., depression, marital therapy). Even when referrals are made, the FCU clinician typically works with caregivers to enhance family functioning and parenting practices in the context of the given stressor.

Engaging families in treatment after the feedback session is a delicate process, involving a balance between respect for their current priorities and time constraints as well as the clinical knowledge about how to best support the change process. Families typically generate three to four goals, and, based on a review of one study (Shaw, 2004) with toddler-age children, caregiver goals fell into three main categories: (a) improving child behavior, (b) improving parenting skills, and (c) family self-sufficiency, which refers to the family's desire to improve their circumstances. Child-focused goals include: reducing child aggression, increasing compliance, reducing tantrums, and improving social skills (e.g., "For Tony to play and get along better with other children without hitting"; "For Rachel to share better with other children"; "For Ryan to learn better ways to cope when he's upset or frustrated"). Goals related to parenting skills included those focused on setting limits, using consequences and time out, and being more consistent (e.g., "Increase limit setting and discipline strategies"; "Sean will accept limits without tantruming"), as well as those aimed at increasing positive parent–child interaction, such as: using more praise, planning ahead to prevent child misbehavior, developing schedules and routines (such as bedtime), and planning activities for child while mom is busy, improving general parenting skills and co-parenting (e.g., "Create a family schedule and routine to help daily life run smoother").

Given the sometimes disorganized and chaotic nature of high-risk family environments, goals in the area of family self-sufficiency were a blend that addressed the parent's desire to make their life better and to function more independently, including: finding a job, improving finances, moving to a better neighborhood or apartment, and completing or continuing education. In many cases, when clinicians are able to work with families on their goals of self-sufficiency, it opens up the unique opportunity to support the caregivers' parenting practices during times of family upheaval and transition.

Additionally, many parents set goals to address language or developmental delays discovered in their children, and may set goals to address their own self-care. For example, it is common for parents to seek psychosocial or psychiatric treatment for their own mental health concerns subsequent to their involvement with the FCU. Again, even when families are referred for mental health treatment, the FCU clinician can continue to work with the family on parenting practices and explore the effect that the mental health or substance use issue is having on their child and family life. The FCU clinician's aim is to assist caregivers with making improvements in their child's life through parenting practices, child management, and any of the broader contextual issues that play a role in the child's healthy development.

When caregivers express the desire to make changes in their parenting behaviors, the feedback session is followed by family management meetings (Forgatch & Patterson, 2010) to promote change in parenting and child problem behavior. Family management includes a collective set of parenting skills, commonly referred to as Parent Management Training (PMT), based on social learning principles of reinforcement and modeling (Forgatch & Patterson, 2010; Patterson, 1982; Webster-Stratton & Hammond, 1997). PMT has been consistently associated with improvement in parenting and reductions in child conduct problems (Bullock & Forgatch, 2005; Patterson et al., 1992) and has been formally deemed an "empirically supported treatment" (Chambless & Ollendick, 2001).

The goal of the FCU is to use assessment and feedback to identify, target, and engage caregivers in intervention services that best fit their individual strengths and challenge areas. The Everyday Parenting Curriculum (EPC) is a comprehensive follow-up component which addresses three main skill sets for the parents of young children: positive behavior support, limit setting and monitoring, and relationship skills (Dishion, Stormshak, & Kavanagh, 2012). The EPC is used strategically with caregivers, informed by the feedback session, integrated strengths and challenge areas, as well as motivation for change. The EPC provides clinicians with a structured method for successful teaching and practice with parents in each of these key skill areas. For example, each chapter or topic area of the EPC begins with the reestablishment of the collaborative set—do caregivers and clinicians share the same session goals? Once this is clarified and adjusted as needed, clinicians then provide parents with a rationale to stimulate interest, followed by a careful explanation of new skills, and in-session practice using role plays and in vivo practice with the child.

As an example, consider a mother who has strengths in the area of positive behavior support, but who tends to become irritable and angry when her child doesn't listen. As a result, mother and son often engage in coercive, acrimonious interactions. Based on a goal to improve her skills in setting limits, this mother and therapist could begin their work by tracking the effectiveness of the requests she currently makes to gain a better picture of the dyad's patterns of interaction. Then, based on that assessment (e.g., Does she give too many requests at once? Does she threaten consequences that are too big if the child does not comply?), the clinician can use didactic (provide a rationale for learning new skills) and experiential (role-play practice) methods to develop her skills in making effective requests. Contextual factors that may influence the parent's success in using these new approaches (e.g., parental wellbeing, social support) are also discussed as these issues surface in attempting to make these changes.

In another common example, consider a father who is very skilled and consistent with setting limits; by all reports the children listen well to him. However, he does not use much praise or positive reinforcement for his children's good behavior. Again, given a parent-stated goal to improve skills in the area of positive behavior support, the clinician and father can meet to discuss specific strategies for increasing his noticing of his children's good behavior and also sensitize him to the benefits of using these strategies for both his children and himself. Opportunities for practice will likely arise during the session; the clinician can coach the parent through some initial scenarios and then build on this success to coach the parent through in vivo practice with the child during sessions. Practicing parenting skills during sessions and with children present is one of the components found to increase effect sizes among parent training programs (Kaminski, Valle, Filene, & Boyle, 2008).

Summary

The above examples highlight the highly tailored nature of both the FCU and the EPC. With a thorough assessment of caregiving skills and challenges coupled with parent awareness and stated goals, the ensuing parenting work can move with an almost surgical precision. The FCU model allows the clinician to very directly meet the parent's needs and stated goals while considering the broader contextual issues as they relate to the presenting concerns and treatment goals. The FCU is an empirically validated

model that supports the efficient provision of parent skills training within an ecological and culturally sensitive framework. Furthermore, the FCU represents the type of model that could easily be embedded in the larger systems that surround families and children.

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