

## CHAPTER 1

# School Readiness

## *Introduction to a Multifaceted and Developmental Construct*

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As stated in the preface of this book, modern democracies must increasingly rely on an integrated care-and-education system that provides their future citizens with the intellectual skills required to understand the world, adapt to constantly evolving socioeconomic conditions, and succeed in the workplace. At the same time, this system is also expected to nurture the social-emotional attitudes and values that help them reconcile the pursuit of individual happiness with that of the collective good. This is quite a challenge.

Clearly, the stakes and hopes are high but, unfortunately, the results do not always meet the expectations; many children and youth experience school difficulties. For instance, in 2007–2008, 28% of Québec youth less than 20 years of age had not yet graduated from secondary school and were not attending a secondary school (Ministère de l'Éducation, du Loisir et du Sport, 2010). In the United States, 22% of youth fail to complete high school, with rates much higher among minority groups, averaging 47% for Hispanic students and 50% for African American students (Children's Defense Fund, 2004).

School dropout is a significant national problem in Canada and in the United States (HRSDC-Statistics Canada, 2011; U.S. Department of

Education, 2012), as it may set individuals on a life trajectory marked by employment upheavals, as well as physical and mental health adversities (see Vitaro, Brendgen, & Tremblay, Chapter 2, this volume). This phenomenon also extends beyond high school. For instance, in 2007–2008 in Québec, dropout rates in college (2 years of postsecondary schooling) reached almost 30% in preuniversity programs, and were above 40% in technical programs (Ministère de l'Éducation, du Loisir et du Sport, 2010). Low levels of schooling in turn create significant challenges for youth in the workplace. For example, among teens and young adults (ages 16–24) in the United States, unemployment rates exceed 50% for those without a high school education, relative to 75% among high school graduates, 86% among youth with 1–3 years of postsecondary schooling, and 95% among those with a 4-year college degree (Sum, Khatiwada, & McLaughlin, 2009).

Despite the clear long-term financial advantages of higher education, many youth do not pursue postsecondary education or they drop out before completion. To some extent, students are deterred by challenges associated with access or financing, but in addition, many fail to move forward because of professional indecisiveness and poor readiness, resulting from a lack of academic preparation, motivation, and achievement (Howell, Kurlaender, & Grodsky, 2010). The general hypothesis underlying this volume is that these various forms of school disengagement reflect personal “risk” factors that are partly rooted in early childhood experiences.

Clearly, school dropout (or nongraduation) is a major problem for any society that increasingly relies on a knowledge-based economy. However, because school dropout rates are crude estimates, they barely reflect the “tip of the iceberg” in terms of society’s shortcomings in building human capital. Indeed, a broader concern is that the level and quality of learning and training of society’s children and youth are compromised by weak educational experiences. For instance, in 2007, it was estimated that more than 40% of the labor force in Canada (i.e., the population ages 16–65) lacked the literacy skills (i.e., the ability to find, synthesize, and use written information), and that 50% lacked the basic math abilities (i.e., managing numbers) needed to succeed in today’s economy (Canadian Council on Learning, 2007). Similarly, in a 2003 national study of the U.S. population, 14% emerged as functionally illiterate, and an additional 29% had only the basic level of literacy skills needed for everyday activities (National Center for Educational Statistics, 2003). These figures raise concerns about the number of children and youth who are not learning the skills needed to function adequately in a knowledge-based economy. These educational deficits also jeopardize the capacity of many citizens to critically appraise policies and politics, one of the keystones of a healthy democracy.

## SCHOOL READINESS AND SCHOOL ACHIEVEMENT

In recent years, efforts have focused increasingly on improving long-term educational outcomes by improving early learning, based on research suggesting that school readiness and initial school learning set the pace for later school attainment (Zaslow, Tout, Halle, Vick, & Lavelle, 2010). There is little doubt that over the course of schooling, achievement results from complex transactions among personal, familial, social, and school factors operating over time, and that the early learning years lay a critical foundation for these later developmental transactions and trajectories. For example, recipients of high-quality early childhood education tend to show long-term benefits in areas of achievement, grade progression, and high school graduation (Stegelin, 2004; Vandel et al., 2010), but these general trends must be qualified (see Côté, Geoffroy, & Pingault, Chapter 6, this volume). Accordingly, a thorough understanding of the origin and development of school trajectories commands an integrated longitudinal approach that starts in early childhood and considers a variety of behavioral, familial, relational, and societal antecedents (Barclay & Doll, 2001; Doll & Hess, 2001).

The search for the developmental roots of school achievement has generated a surge of interest in the construct of school readiness (Pianta, Cox, & Snow, 2007; Rimm-Kaufman & Pianta, 2000). According to the most common view, *school readiness* refers to the basic skills that children need to possess at school entry in order to adapt successfully to the school environment and to learn and achieve at a satisfying level (Forget-Dubois et al., 2007). It may be defined as a threshold, that is, the minimum developmental level allowing the child to respond adequately to school demands (Carlton & Winsler, 1999), but it is more often used as a relative term; a child may be more or less likely to make the transition into grade school successfully and thrive as a function of a variety of cognitive and social-emotional skills and characteristics.

There is no consensus on a precise content definition of school readiness. For example, teachers and parents may have different views regarding the child characteristics that make him or her “ready for school.” Whereas parents define readiness in terms of academic abilities (i.e., literacy and numeracy), teachers more often emphasize health conditions (i.e., being rested and well fed), communication skills, and attitudes (i.e., curiosity and motivation) toward scholastic activities (Rimm-Kaufman, 2004; Rimm-Kaufman, Pianta, & Cox, 2000). In general, however, researchers and stakeholders agree that school readiness should be defined multidimensionally, with a consideration of the multiple health, cognitive, emotional, and social characteristics that reflect the child’s ability to function successfully in school contexts. According to this child-centered,

multifactor view, measures of school readiness generally assess a variety of cognitive, language, behavioral, motor, and social-emotional skills. For instance, readiness to achieve in school depends on self-regulation skills, such as the capacity to focus attention, follow the teacher's instruction, persist in learning tasks (Blair, 2002; Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008), and the social-emotional skills needed to integrate harmoniously with the peer and school milieu, cooperate, and get along well with peers and teachers (Ladd, Herald, & Kochel, 2006; Parker & Asher, 1987), as well as the cognitive skills and knowledge components necessary to achieve adequately in school (LaParo & Pianta, 2000; Scarpati & Silver, 1999). These various components are correlated, but each contributes in some significant and unique ways to school readiness.

### **THE RELEVANCE OF SCHOOL READINESS FOR SCHOOL ACHIEVEMENT AND DEVELOPMENTAL HEALTH**

Fueled by a growing awareness of the importance of school readiness, and the sizable number of children who start school without it, interest in early childhood education has surged during the past two decades (Pianta et al., 2007). Research documenting the developmental experiences that promote school readiness, as well as the consequences of poor school readiness, has proliferated. As indicated previously, one of the major reasons underlying the growing interest in school readiness lies in its potential to provide information about the future school trajectories, or, stated otherwise, in its predictive validity regarding future school achievement and overall adjustment. To the extent that school success may depend on entering school "ready to learn," achieving school readiness prior to school entry should be considered one of the most important developmental tasks facing preschool-age children (LaParo & Pianta, 2000).

This burgeoning field of research has shed light on the multifaceted nature of school readiness. Several longitudinal datasets are now available, following children in the United States and Canada from school entry through high school completion. Results from these developmental studies underscore the importance of initial school adjustment, and its predictive significance. For example, there is cumulating evidence that cognitive skills assessed in late preschool and at school entry predict later school achievement. Fluid cognitive skills, such as executive functions and memory, are seen as prerequisites of future school achievement (Blair, 2006), but more crystallized preacademic knowledge components, such as knowledge about letters and numbers, have also been shown to predict early school achievement over and above general cognitive ability (Hess, Holloway, Dickson, & Price, 1984; Lemelin et al., 2007). A meta-analysis

by LaParo and Pianta (2000), based on 70 independent studies, revealed that preschool and kindergarten cognitive readiness measures, especially those targeting literacy and numeracy, predicted early school achievement in a moderate-to-strong way. A recent study conducted in six different samples in the United States, the United Kingdom, and Canada showed that the strongest predictors of later school achievement (i.e., in math and reading) were school-entry math and reading, as well as attention skills (Duncan et al., 2007). This study was especially noteworthy for raising awareness that early math skills and knowledge play a particularly important role for later school achievement. While the strong predictive validity supports the use of such measures for screening purposes (i.e., the identification of children at risk), at the same time, it also indicates that other, noncognitive factors are involved.

Early disparities in school readiness associated with socioeconomic disadvantage are particularly striking and widespread, with approximately 1 in 5 children entering school with low academic readiness and elevated emotional or behavior problems that reduce their capacity to engage and learn at school (Rimm-Kaufman et al., 2000). Over 40% of children growing up in poverty demonstrate delayed language skills and social skills at school entry, and over 20% exhibit high rates of disruptive behavior problems that undermine school adjustment (Macmillan, McMorris, & Kruttschnitt, 2004). Longitudinal studies show that at least half of the long-term educational achievement gaps between poor and nonpoor children exist at school entry, and this “achievement gap” associated with poverty widens over time (Ryan, Fauth, & Brooks-Gunn, 2006). Yet socioeconomic factors only partially account for school readiness and the lack thereof, and research has started to uncover other personal and familial risk factors that need to be considered to explain more fully why so many children lack the academic and social-emotional skills to connect and learn in school.

Research documents the powerful impact social environments may have on developmental processes early in life. Recent advances in developmental neuroscience have illuminated the importance of the early childhood years for the development of the neural architecture for learning—the cognitive structures that support the regulation of attention, behavior, and emotion (Hughes, 2011). We now understand how early experiences influence these important aspects of brain development, fostering the neural connections that provide the foundation for learning, reasoning, problem solving, social skills, and school success. However, there are no fixed paths. The early phases of brain organization are characterized by high levels of plasticity. Early experiences provoke changes that may become embedded in the neurobiological systems, but these changes often combine with a cascade of environmental events and

contexts to influence future cognitive, emotional, and behavioral development (Hughes & Ensor, 2009). Unpacking the personal, familial, and socioeconomic factors that contribute to school readiness and account for disparities within populations is of critical importance to inform early intervention and prevention programs. From a prevention perspective, the capacity to identify before school entry and, inasmuch as is possible, earlier in the preschool period, specific risk markers of future, school-related problems offers considerable potential for providing at-risk individuals or groups of children with early interventions that reduce their later risks (Bierman, Domitrovich, Nix, Welsh, & Gest, Chapter 10, this volume; Blair & Diamond, 2008; Duncan et al., 2007).

### **INTERVENTIONS TO PROMOTE SCHOOL READINESS AND EARLY LEARNING**

Parallel to this growing base of developmental research, recent years have witnessed a great increase in early intervention research focused on understanding optimal early childhood educational practices and beneficial methods of early intervention for at-risk children. The good news is that positive change is possible when the efforts are intense and lasting. Long-term assessments of early preventive interventions, such as home visitation programs and early childhood education programs, document the potential for long-lasting positive effects for children, families, and society (Barnett, 1995). We now know that interventions fostering positive, nurturing experiences in the early years of childhood can have lifelong benefits, including increased learning abilities, school success, involvement in community activities, active participation in the labor market, and quality of life.

Despite these research advances, which broaden our understanding of school readiness and strategies to enhance it, a significant gap exists between the guidelines and programming implemented by school districts, and the research base. Developmental and intervention research provides rich working models to support early learning and improve school readiness. However, this information only trickles down slowly to potential users, perhaps because it is not easily accessible to practitioners or policymakers, or because this knowledge basis has tended to develop in silos, that is, with little connection across domains. For instance, findings from the field of developmental science have not been effectively integrated with findings from the field of education. Little has been done to bring these research areas together to form a comprehensive picture aimed at developing an understanding of school readiness, early school achievement, and later school success.

This volume is intended to bring together these complementary interdisciplinary efforts spanning the domains of theory, research, practice, and policy. It is organized into four sections: Part I—Setting the Stage: The Importance of School Readiness for School Success; Part II—Determinants of School Readiness; Part III—Supporting School Readiness with Evidence-Based Programs and Practices; and Part IV—Going to Scale with Evidence-Based Programs: Sustaining High-Quality Practice. The volume starts with this overview chapter along with three chapters that review longitudinal research and underscore the importance of focusing on school readiness as a predictor of later school success. Taking advantage of various population-based longitudinal studies spanning the different periods of development, these studies “set the stage” for the following chapters, by identifying the child characteristics, as well as school, family, and community risk and protective factors that predict the course of schooling and adolescent outcomes from the preschool years and school entry. In these three chapters, important issues concerning the conceptualization and measurement of school readiness are discussed, and the determinants and impact of school readiness on later schooling outcomes are informed by a broad range of developmental literatures and longitudinal study analyses. In Chapter 2, Vitaro, Brendgen, and Tremblay document the longitudinal associations between disruptive behaviors at school entry, such as inattention–hyperactivity and aggression–opposition, and the later course of academic achievement, school motivation and high school graduation. In Chapter 3, Boivin, Desrosiers, Lemelin, and Forget-Dubois describe how multifaceted school readiness measures suitable to a population-based approach substantially predict early school achievement, and significantly mediate the contribution of a variety of early childhood risk indicators to early school achievement difficulties. Using a twin design approach, they also show that familywide environments underlie these strong predictions.

The chapters in Part II build upon the developmental framework, and fill in the earlier phase of development for two specific classes of personal and environmental determinants of school readiness: language and nonparental care. These chapters feature the early developmental predictors and trajectories leading to school readiness using shorter-term, process-oriented approaches. Chapter 4, by Wade, Prime, Browne, and Jenkins, presents a multilevel perspective to examine the relative contributions of different types of risk in explaining early cognitive school readiness. The focus here is really on the early years (0–3), and on the interplay of individual characteristics (early language) and family and neighborhood experiences in the predicting early reading and expressive language. In Chapter 5, Dionne, Mimeau, and Mathieu focus on the role of early language development and language stimulation in the family

setting for children's readiness to read at the formal entry into school. Drawing from results in two population-based longitudinal studies, the chapter describes the mechanisms linking predictors of reading readiness over time, including genetic liabilities and early literacy practices in the home. Finally, in Chapter 6, Coté, Geoffroy, and Pingault review the empirical evidence regarding the putative role of early child care experiences in promoting cognitive school readiness. The review covers and distinguishes population-based studies, which typically compare children and families who use different type of child care settings at various intensities, to smaller studies, which provide for more fine-grained analyses of the quality of the child care settings.

Part III includes five chapters focused on evidence-based programs that have demonstrated improved school readiness in rigorous randomized or quasi-experimental designs. Chapter 7, by Wasik and Hindman, describes and discusses factors that influence the development of reading skills, with a special focus on children who experience academic difficulties. This chapter also reviews the intervention research on language, especially early vocabulary-focused interventions and professional development models for teachers, and discusses the implication of this knowledge basis for early education. The chapter also describes one successful intervention: *Exceptional Coaching for Early Language and Literacy* (ExCELL).

Chapter 8, by Starkey, Klein, and DeFlorio, begins with an overview of early mathematical development, describing developmental processes that span the age period from birth through kindergarten. It also describes recent intervention research, namely, an early math home and classroom intervention program, Pre-K Mathematics, illustrating how mathematical knowledge can be enhanced in economically disadvantaged children by math enrichments in their classroom and home learning environments.

Chapter 9, by Li-Grining, Lennon, Marcus, Flores, and Haas, describes the development of the executive control skills, a major component of self-regulation skills associated with the maturation of the prefrontal cortex, and the socialization experiences that foster or impede its development. Sometimes described as the "neural architecture for learning," these skills figure centrally in school readiness; they support sustained attention, as well as behavioral and emotional regulation, fostering the self-control needed for school success. A central focus of the chapter is the Chicago School Readiness Project (CSRP), an intervention program designed to improve low-income children's readiness for school by fostering their self-regulation.

In Chapter 10, Bierman, Domitrovich, Nix, Welsh, and Gest present empirical evidence supporting a focus on social-emotional development during the preschool years as a method for enhancing school readiness.

Interventions with documented effects on improving social-emotional school readiness are reviewed. The chapter also describes the theoretical foundations, the curriculum materials, and the teaching strategies of the REDI program, and reviews results from a randomized evaluation trial. The chapter terminates with a discussion of implications for professional development and practice. Finally, in Chapter 11, Welsh, Bierman, and Mathis review the developmental research that documents the role parents play in supporting child cognitive and social-emotional school readiness, as well as intervention studies that use parent education and home visiting to support parenting skills and reduce school readiness delays.

Efficacy studies of programs that have promoted school readiness provide guidance on how to close the socioeconomic gap in school achievement. However, to have substantial impact at the population level, larger-scale efforts are needed to promote the national dissemination of evidence-based school readiness programming. The chapters in Part IV examine the challenges associated with “going to scale” with evidence-based early childhood programs, and disseminating and sustaining high-quality practices on a broad, national basis. In Chapter 12, Peters and Howell-Moneta review the current research literature on school readiness and early child development programs, then describe the Better Beginnings, Better Futures program, a large-scale, community-based prevention designed to facilitate school readiness and successful transition into school. Developed for families with young children, and implemented in eight disadvantaged neighborhoods in Ontario, this primary prevention program provides a model for engaging communities in the development and implementation of evidence-based early childhood programs. In Chapter 13, Poulin, Capuano, Vitaro, Verlaan, Brodeur, and Giroux provide an overview of the Fluppy prevention program’s history and content, and a summary of the results of an initial evaluation trial. Widely implemented in the province of Québec, the Fluppy program is offered to children in kindergarten and consists of several types of intervention that engage parents, teachers, and classmates. The authors describe its dissemination across Québec, document a number of implementation issues, and discuss the results from a recent impact study. The chapter illustrates a range of implementation issues that emerged during the period of provincewide dissemination.

The volume concludes with a commentary on policy implications provided by Santos, and a final summation by Bierman and Boivin. These chapters integrate findings and articulate important general implications of the groundbreaking research described in this book. The advances in conceptualization and methodology, the discovery of malleable antecedents and mediators of school readiness, and the new data on the efficacy of evidence-based practice all create a solid foundation for improving

current early childhood programs and practices. If we can surmount the challenges of going to scale, we have the potential to close the achievement gap associated with poverty and promote the school readiness of all children, giving them a strong starting base for future achievement. In the final chapter, we summarize the implications the volume holds for future research, for future directions and priorities in early childhood practice, preventive intervention, and policy.

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