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Strengthening school readiness for Head Start children: Evaluation of a self-regulation intervention

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ABSTRACT

The present study examined the efficacy of a self-regulation intervention for children experiencing demographic risk. Utilizing a randomized controlled design, analyses examined if children ($N = 276$ children in 14 Head Start classrooms; M age = 51.69, $SD = 6.55$) who participated in an 8-week self-regulation intervention demonstrated greater gains in self-regulation and academic achievement over the preschool year compared to children in a control group. In addition, indirect intervention effects on achievement outcomes through self-regulation were explored and differential intervention effects for English language learners within a sample of children from low-income families were tested. Results indicated that children in the intervention group demonstrated stronger levels of self-regulation compared to the control group in the spring of the preschool year. Group comparisons also revealed that the intervention was related to significantly higher math skills for children who were English language learners. In other words, English language learners who participated in the intervention demonstrated stronger levels of math in the spring of preschool in comparison to children in the control group and relative to English speakers who also participated in the intervention. The present study provides support for the efficacy of a school readiness intervention in promoting self-regulation and achievement in young children, especially English language learners.

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Strengthening school readiness for Head Start children: an evaluation of a self-regulation intervention

In the United States, more than one in five children live in poverty (U.S. Census Bureau, 2011). A great deal of research suggests that poverty adversely affects many aspects of children's development (Bradley & Corwyn, 2002; Duncan & Brooks-Gunn, 2000). Socio-demographic risk can be particularly detrimental for the development of young children's self-regulation skills (Mistry, Benner, Biesanz, Clark, & Howes, 2010), skills that are critical for academic success (Blair & Razza, 2007; McClelland, Acock, & Morrison, 2006). Research highlights that self-regulation may be a malleable and teachable mechanism for improving school success, especially for young children from disadvantaged backgrounds; however, little is known about targeted, systematic approaches to improving these skills prior to kindergarten entry. Even less is known about how participating in self-regulation interventions might have differential effects on subgroups of children and how intervention-related self-regulation gains impact academic outcomes. The present study evaluated a game-based, self-regulation intervention aimed at improving self-regulation for children enrolled in Head Start. In addition to examining the effects of intervention participation on self-regulation gains over the year, we examined the impact of intervention participation on academic achievement within subgroups of children (i.e., children from low-income families who were English language learners).

Theoretical and conceptual framework

Self-regulation has been conceptualized in various ways depending on the discipline; however, it is generally recognized as a

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multidimensional construct that includes aspects of emotion, cognition, and behavior (McClelland, Cameron Ponitz, Messersmith, & Tominey, 2010). In the present study, we focus on the behavioral aspects of self-regulation most salient in classroom contexts, which are informed by three underlying executive function processes (Best & Miller, 2010; Miyake, Friedman, Emerson, Witzki, & Howerter, 2000): working memory (holding information in mind; Gathercole, Pickering, Knight, & Stegmann, 2004), attentional flexibility (maintaining focus and adapting to changing goals; Rueda, Posner, & Rothbart, 2005), and inhibitory control (stopping a dominant response in favor of a more adaptive one; Dowsett & Livesey, 2000). We define self-regulation in the present study as the integration of these three executive functions into overt behavior (McClelland et al., 2010).

Self-regulation involves environmental and developmental processes as indicated by recent theoretical work (Blair & Raver, 2012; McClelland, Geldhof, Cameron, & Wanless, 2014). For example, psychobiological models posit that the quality of caregiving that children experience is a key mediator linking early environmental inputs (e.g., poverty) and self-regulation (Blair & Raver, 2012). Intervention research suggests that self-regulation demonstrates relative plasticity throughout the life span (Diamond & Lee, 2011), and that early childhood may be a sensitive period for the development of self-regulation (Carlson, Zelazo, & Faja, 2013). Thus, self-regulation during preschool may be an important mechanism to target for improving children's school readiness.

Self-regulation and academic achievement

Research suggests that early childhood is an important period for the development of self-regulation (Carlson et al., 2013). It is during preschool that children experience significant growth in the prefrontal cortex, the area of the brain most closely associated with self-regulation. Moreover, evidence suggests that self-regulation is foundational for school success in that it helps children navigate structured learning environments, avoid distractions, pay attention, stay on task, and persist through difficulty (McClelland et al., 2014b). Thus, it is no surprise that self-regulation is related to academic achievement in early childhood and beyond (Blair & Razza, 2007; McClelland et al., 2007). For example, children with strong self-regulation (measured by teacher report and direct assessments) in preschool and elementary school also score higher on measures of achievement (Cameron Ponitz, McClelland, Matthews, & Morrison, 2009; McClelland et al., 2006; McClelland, Morrison, & Holmes, 2000). In addition, early self-regulation predicts long-term academic achievement, such as high school and college completion (Breslau et al., 2009; McClelland, Acock, Piccinin, Rhea, & Stallings, 2013). Together, this research highlights the importance of self-regulation for academic success, and indicates that improving self-regulation in preschool may have long term effects.

The impact of risk on self-regulation development

Demographic risk, such as poverty, can have negative consequences for a range of developmental outcomes (Duncan & Magnuson, 2005; Evans & Rosenbaum, 2008; Komro, Flay, & Biglan, 2011; McClelland et al., 2000; Mistry et al., 2010; Sektnan, McClelland, Acock, & Morrison, 2010). Decades of research underscore the negative relation between poverty and academic achievement (Duncan & Magnuson, 2005), and more recent work indicates similar negative impacts on children's self-regulation (Raver, Blair, & Willoughby, 2013; Wanless, McClelland, Tominey, & Acock, 2011c). For example, in one study, children from low-income families demonstrated poorer self-regulation skills in the fall of the preschool year relative to their more advantaged peers (Wanless et al., 2011c). Indeed, poverty can put insurmountable stress on families, and recent psychobiological models indicate that poverty-related adversity can inadvertently affect self-regulation through reductions in the quality of the home environment (Blair & Raver, 2012). Specifically, poverty-related stress can impact parents' abilities to provide stimulating home environments that encourage children to practice the skills related to strong self-regulation (e.g., paying attention, remembering rules, controlling impulses; Bradley et al., 1989; Hart & Risley, 1995; McClelland et al., 2000).

When paired with poverty, being an English language learner (ELL) can also have negative consequences for the development of self-regulation and academic outcomes (Wanless et al., 2011c). Many Latino children (65%) live in homes where Spanish is the primary language (Lopez, Barrueco, & Miles, 2006), and can be considered ELLs. In the United States, ELLs tend to come from poorer and less educated families (U.S. Census Bureau, 2006), and these compounded risks (in comparison to ELL status alone) can negatively influence academic outcomes (Galindo & Fuller, 2010; Han, 2012) and self-regulation (Wanless et al., 2011c). For example, parents who are poor and have low levels of education are less likely to engage in behaviors in the home that support early numerical development (e.g., counting, quantity comparisons) than parents who are high-income and have higher levels of education (Vandermaas-Peeler, Nelson, Bumpass, & Sassine, 2009). Although a growing body of literature indicates that children who show bilingual fluency are at an advantage for academic achievement due to greater cognitive flexibility and abstract thinking skills (Bialystok, 1988; Bialystok & Herman, 1999), children who are learning English as a second language and have limited English proficiency do not share these benefits (Gándara, Rumberger, Maxwell-Jolly, & Callahan, 2003).

These studies suggest that children experiencing demographic risk, particularly those experiencing cumulative risk (e.g., being low-income and learning English), may be an important population to target for intervention. Moreover, given the noted variability in self-regulation skills across different levels of socioeconomic disadvantage, it is possible that early childhood interventions could have differential effects for children experiencing varying levels of risk. Indeed, past research has reported that children who are the most disadvantaged benefit the most from early intervention (Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008).

Self-regulation interventions

The number of comprehensive preschool interventions including self-regulation components has grown over the years as a result of a large body of evidence suggesting that these skills are critical for academic success (Diamond & Lee, 2011). Many of these interventions have shown substantive results (Barnett et al., 2008; Bierman et al., 2008; Diamond, Barnett, Thomas, & Munro, 2007; Pears, Fisher, & Bronz, 2007; Raver et al., 2011). For example, the Kids in Transition to School Program (KITS), which focuses on increasing school readiness has been effective in improving self-regulation and decreasing behavior problems in children living in foster care (Pears et al., 2007; Pears, Kim, & Fisher, 2012). The Tools of the Mind program integrates multiple facets of development (e.g., cognitive, socio-emotional), and although mixed, there is some evidence that participating in this program leads to improvements in self-regulation (Barnett et al., 2008; Diamond et al., 2007). The Promoting Alternative Thinking Strategies (PATHS) curriculum (Kusche & Greenberg, 1994), utilized in the Head Start REDI (Research-Based, Developmentally Informed) intervention, has also been effective in improving preschool children's socio-emotional competence and self-regulation (Bierman et al., 2008; Domitrovich, Cortes, & Greenberg, 2007). Finally, the Chicago School Readiness Project (CSRP), a comprehensive intervention focused on training teachers to use specific classroom strategies

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