Early Childhood Research Quarterly 26 (2011) 169–181

Contents lists available at ScienceDirect

Early Childhood Research Quarterly

Use your words: The role of language in the development of toddlers' self-regulation

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ARTICLE INFO

Article history:
Received 21 December 2009
Received in revised form 19 August 2010
Accepted 2 September 2010

Keywords:
Self-regulation
Language development
Symbol
Gender differences
Vygotksy

ABSTRACT

Self-regulation emerges throughout early childhood, and predicts later success in socially and cognitively challenging situations. Vygotsky proposed that symbols, particularly words, serve as mental tools to be used in service of self-regulation. Cross-sectional research indicates a positive but inconsistent association between language and self-regulation skills throughout toddlerhood, but research has not accounted for general cognitive development, nor gender differences in these domains. We used growth modeling of longitudinal data for 120 toddlers collected when children were 14, 24, and 36 months to test the impact of two expressive language skills – spoken vocabulary and talkativeness – on the growth of toddlers' self-regulation, and to determine whether associations between these domains exist when controlling for cognitive development. Results reveal gender differences in self-regulation trajectories, and in the impact of language on self-regulation. Vocabulary is a better predictor of self-regulation than talkativeness, and both concurrent and prior vocabulary positively predicted children's levels of self-regulation. When cognitive development was controlled, 24-month vocabulary still predicted the trajectory of self-regulation. Results reveal that, even in early development, words are tools that can be applied to the task of self-regulation, and may be a more necessary tool for boys than for girls at this age.

1. Introduction

"Use your words" is a common phrase addressed to toddlers and preschoolers who are acting out in frustration. This phrase reveals the common belief that when children have the words to express their desires, needs, or feelings, they can better regulate their behavior to match the social expectations of the situation. The ability to self-regulate enables children to adapt to and gain the most from their environments; thus much attention is given to the developmental processes and experiences that help children develop self-regulation skills. Several studies have found positive associations between language skills and pro-social and self-regulatory behavior in 3–5-year-olds in both typical (e.g. Astington & Jenkins, 1999; Cutting & Dunn, 1999) and atypical populations (Cole, Zhan-Waxler, & Smith, 1994; Spira & Fischel, 2005). However, few studies have examined such associations for children under three, when there is wide variation in language skills, and when developmentally based interventions may be most valuable. Cole, Armstrong, and Pemberton (2010) review the research on the development and integration of expressive language and self-regulation skills, and pose the question: do children need to develop a certain level of expressive language, executive functioning, and emotion regulation as separate domains before these skills are integrated? Thus, we may ask whether parents and educators have unrealistic expectations about the role of language in the self-regulatory skills of toddlers when they use the phrase "Use your words" to encourage a child's verbal self-regulatory skills. Do language skills support the self-regulation of even very young children, or do these skills integrate only later in development once children are more consistent users of language? Further, if language skills do support self-regulation, which aspects of language help children self-regulate? It might be that children who talk more exert more control over their environments and thus are less frustrated. Or it may be that children who have larger vocabularies, indicative of larger symbolic repertoires, have more mental tools to use in service of self-regulation. This paper addresses the commonly held belief that young children's language skills support their self-regulation by examining the longitudinal development of these skills in toddlers.

1.1. The development of self-regulation in young children

Self-regulation is widely recognized as a critical social-emotional skill underpinning children's abilities to act pro-socially with peers and adults, participate productively in learning activities, and adapt successfully to new or challenging situations. Kopp

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0885-2006/$ – see front matter © 2010 Elsevier Inc. All rights reserved.
doi:10.1016/j.ecresq.2010.09.002

(1982) described the basic development of self-regulation in early childhood as growing from early reactive reflexes to proactive and conscious planning processes (Bronson, 2000; Kopp, 1982). In the toddler years, between 1 and 3 years of age, self-regulatory skills are still rudimentary, yet develop rapidly. In the first half of the second year, children gain awareness of social requirements and expectations and can initiate and terminate actions to comply with these expectations and to achieve social and physical goals. In the third year of life, children's growing representational skills underpin their ability to exert control on their own actions in response to internal representations such as rules, rather than just in reaction to a parent's immediate prohibitions or reminders (Kopp, 1982).

One source of variation in early self-regulation is gender. Weinberg and colleagues have documented that within the first year of life, girls show a greater diversity of self-regulatory strategies, and maintain their physiological regulation more consistently in the face of external challenges, such as mothers' absence (Weinberg, Tronick, Cohn, & Olson, 1999). Further, Raikes and colleagues found that girls had higher self-regulation skills throughout toddlerhood between 14 and 36 months of age (Raikes, Robinson, Bradley, Raikes, & Ayoub, 2007). Another source of variation in young children's self-regulation is their general cognitive skills, particularly the development of executive functioning which, during early childhood, is particularly dependent upon brain maturation (e.g. Bernier, Carlson, & Whipple, 2010; Stevens, Lauinger, & Neville, 2009).

1.2. Symbol skills support self-regulation

Vygotsky (1934/1986) proposed that self-regulation of thought and behavior is learned through a process in which children learn their culture's symbols and thought patterns by internalizing their caregivers' regulatory speech. According to Vygotsky, internalized symbols – typically words – become mental tools to be used in service of manipulating one's own mind and behavior. Thus, we reason, the broader one's symbolic repertoire, the more tools for self-regulation one has. Kopp (1982; Vaughn, Kopp, & Krakow, 1984) frames the development of self-regulation similarly as an internalization of caregiver-modeled regulatory strategies. In early development, caregivers play a central role in regulating children's behavior and emotion using increasingly cognitive means—that is, by talking to them, providing verbal prohibitions or comforts (Vaughn, Kopp, & Krakow, 1984). Thus, the transition from reactive (e.g. self-soothing after upset) to proactive (e.g. inhibiting pre-potent behavior) regulation is facilitated by children's growing representational abilities, including the internalization of their caregivers' self-regulatory speech facilitated by language development. If this is true for even very young children, we might expect their self-regulation skills to grow as their vocabulary grows rapidly in the second and third years of life.

There is a body of research linking self-regulation and language skills. Most of these studies have been conducted with preschool and older children (e.g. Müller, Zelazo, Lurye, & Liebermann, 2008; Ponitz, McClelland, Matthews, & Morrison, 2009). For example, Bono (2003) found an association between self-regulation and language development in children entering kindergarten, and found that self-regulation mediated the relationship between language and cognitive school readiness. Further, there are studies showing associations between delayed language and behavior problems. For example, observing preschool children with and without language delays in a classroom setting, Qi and Kaiser (2004) found that preschoolers with language delays more often acted aggressively and disruptively, and were less likely to initiate and engage prosocially. Thus, as preschool children's representational repertoires grow, so do their abilities to regulate their behavior in the service of social expectations.

While these studies with older children provide support for the hypothesis that language supports self-regulation, as pointed out by Müller, Jacques, Brocki, and Zelazo (2009), most studies of these two domains either test non-directional associations between language and self-regulation, or use language as a control variable, rather than investigating the contribution of language to self-regulation (Müller et al., 2009). In the current study, we are interested in whether and how language supports the development of early self-regulation.

Evidence for a supportive relationship between language skills and self-regulation also comes from intervention studies. One intervention study by Lederer (2001) documented the effects of a language intervention for late-talking toddlers in the early third year of life. Though the intervention was focused on child vocabulary, parents reported increases in children's social as well as language skills. Another intervention aimed at increasing preschoolers' language skills found that children's participation during preschool predicted their social skills in early adolescence (Niles, Reynolds, & Roe-Sepowitz, 2008). Specifically, the participants had lower acting out behaviors, higher assertiveness, and better social skills with peers. Importantly, these effects varied by gender and by family risk status. Participation in the language intervention had a greater impact on boys' than girls' acting out behavior, and children who came from higher-risk families – in terms of income, parental education, parental employment, and family structure – had greater gains in assertiveness and positive social behavior with peers (Niles et al., 2008).

Cole et al. (2010) propose several ways that expressive language may support self-regulation skills, even in young children. They propose that expressive language provides children with a socially acceptable way to communicate their needs, that language enhances children's abilities to understand internal states, and that language may also serve to help children regulate their own behavior (p. 59). One way that language skills have been documented to contribute to preschool children's self-regulatory abilities is through the use of private speech. While this evidence does not yet extend to children under 3 years old, it is useful to review it here to consider whether this may be one mechanism by which greater language skills may lead to greater self-regulation.

Self-regulatory private speech – or talking to one's self in order to monitor and modify one's own behavior – has been documented as early as the fourth year of life (Winsler, Carlton, & Barry, 2000). Private speech among preschool children predicts social skills such that children who use more private speech to solve problems have greater social skills and fewer problem behaviors (Winsler, De Leon, Wallace, Wilson-Quayle, & Carlton, 2003). Further, both boys' and girls' use of private speech during solitary activities has been associated with teacher-rated self-regulation skills (Broderick, 2001). Both children who are at risk for behavior problems, and those who are not, benefit from using private speech; and both groups increase their use of private speech and their subsequent performance on challenging motor tasks when instructed by a teacher to use speech (Winsler, Manfra, & Diaz, 2007). While the documentation of language used in the service of self-regulation – through private speech – is sparse for infants and toddlers under 3 years old, there is no published evidence that private speech *does not* occur prior to 3 years old. In fact, some work on gestures indicates that children in their second and third years of life can use gestures in a self-reflexive way to modify their own behavior (see Pea, 1980; Rodriguez & Palacios, 2007; Vallotton, 2008).

There are two cross-sectional studies that have addressed the relationship of language and self-regulation in children under 3 years old, both of which show positive associations between the domains. Vaughn et al. (1984) examined the developmental predictors of self-control during toddlerhood between 18 and 30 months