Influences on Self-Regulated Learning in Low-Income Children:

Examining the Role of Private and Social Speech as Self-Regulation Tools

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Lisa Ann Connor

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Abstract

Self-regulated learning (SRL) allows children to become autonomous learners through facilitating their active planning, monitoring, and evaluation of their performance in the classroom. Low-income children have been found to exhibit lower SRL abilities compared to middle-class children. SRL is linked to a number of long-term academic outcomes, and thus, understanding what contributes to this ability is essential for intervention. One potential mediator of children's emerging SRL abilities is language. Social Constructivist Theory provides a lens to view this relationship between language and SRL, denoting the importance of both the physical and social dimensions of the classroom when examining cognitive development. This mixed methods study included observations in five Head Start preschool classrooms, examining children's use of speech (private and social speech) and SRL behaviors (independent and social regulation) throughout daily classroom activities.

Children's proximity to social partners (solitary, dyad, small group, large group) impacted children's use of speech and SRL. In particular, children's use of private speech was negatively associated with the number of social partners in close proximity, while use of social speech peaked when children were proximal to a small number of peers. Children's engagement in independent regulation was most infrequent when proximal to a large group of peers, and social regulation peaked when children were in a dyad or small group of peers. Additionally, a series of path analyses assessed the relationship between children's global vocabulary and SRL as mediated by their use of speech. Results revealed differences between two contexts, play and instruction, suggesting that the role of vocabulary on SRL changes with the current demands of the environment. Finally, a qualitative content analysis was conducted on field notes and a research journal that were completed throughout the observational period. Three overall themes

were found: children's purposes for using private speech, children's purposes for using social speech, and teachers' modeling of verbal strategies to children. Overall, the findings of the present study yield important implications for the role of language in implementing SRL, as well as how to structure both the physical and social environment of the classroom to best promote particular speech and SRL behaviors.

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Chapter 1: Introduction

Self-regulated learning (SRL) requires students to become active participants in their own learning by selecting goals, enacting strategies to meet those goals, monitoring on-line progress, and evaluating past performance (Moos & Ringdal, 2012; Xu, Benson, Mudrey-Camino, & Steiner, 2010; Zimmerman, 1989). Although most studies involving SRL have focused on children in elementary school and older, even very young children regulate their own learning (Neitzel & Stright, 2003; Perels, Merget-Kullmann, Wend, Schmitz, & Buchbinder, 2009). Supporting children's early development of this ability is important, for SRL has been linked to a number of academic outcomes, including reading achievement, academic self-concept, and overall academic performance (Nangdagopal & Ericsson, 2012; Ning & Downing, 2015; Perry & VandeKamp, 2000; Xu et al., 2010; Zimmerman & Schunk, 2008). Children from low-income families have been found to possess lower SRL abilities compared to middle-class children (Vassallo, 2012; 2013). Therefore, identifying factors associated with early SRL can help promote the proper development of this ability, and consequently protect against future academic problems among low-income children.

Children are often ignored as active agents in their own learning; however children do not simply passively receive these regulation abilities from others. While other people exhibit some influence, and the environment provides certain opportunities eliciting SRL, children yield agency as well. Although a number of individual differences may contribute to children's level of SRL such as temperament and general disposition (Boekaerts & Corno, 2005; Zuffiano et al., 2013), other causal factors may exist through which one could potentially intervene, and thereby increase young children's engagement in SRL. This could, in turn, minimize academic struggles in young children, and dramatically reduce future achievement gaps in elementary and middle

school between low-income and middle-class children. One potential factor linked to SRL is language. The purpose of the present study is to understand how low-income children's global vocabulary predicts their development of and engagement in SRL, as well as how they utilize language to enact different SRL strategies.

Types of Speech

Private speech has been identified as speech meant for oneself (Vygotsky, 1987). Use of external private speech has been found to peak during the preschool years (Winsler, Carlton, & Barry, 2000; Winsler, Ducenne, & Koury, 2011). The present study examines the link between language and SRL through the use of private speech. While past research has found a link between children's private speech and overall self-regulation (Lee & McDonough, 2015; Winsler, de Leon, Wallace, Carlton, & Willson-Quayle, 2003), these studies define self-regulation in terms of controlling one's behavior and emotions (behavior modification) rather than regulating one's thinking and learning. Therefore, these findings more accurately depict the relationship between private speech and self-regulation rather than SRL. Although there appears to be a positive relationship between use of private speech and self-regulation in preschool children, no one has directly studied the relationship between SRL and private speech, and how the use of private speech may be linked to particular regulation strategies.

Another potential verbal strategy children may use as self-regulated learners is social, or communicative speech. Through the use of social speech, children can seek help from others, ask questions, and request additional information, all forms of social regulation (Demirtas, 2013; McTigue & Liew, 2011; Newman, 2000; Rice, 1989). Additionally, a more-skilled other can provide children with scaffolding to help them complete a task (Vygotsky, 1987; Zimmerman & Schunk, 2011). To engage in these exchanges requires that children possess adequate expressive

and receptive language abilities to successfully ask for help and comprehend the assistance provided. Therefore, children's social speech appears strongly related to their subsequent SRL outcomes in the classroom.

With that in mind, one may expect children with higher global vocabulary abilities to rely on verbal SRL strategies more often, or to be more successful in doing so. The role of global vocabulary abilities in SRL is understudied in the literature. Only one study, to my knowledge, has explored this relationship and found that children with higher expressive language used private speech more efficiently in self-regulation, but not more often (Manfra & Winsler, 2006). Therefore, children with higher language abilities may be more successful self-regulators regardless of their reliance on verbal strategies. How global vocabulary abilities contribute to SRL remains uncertain.

Role of Context

Past research has emphasized the important role of context on children's learning (Bodrova & Leong, 1996; Tobin & Dawson, 1992). Social Constructivist theory further explicates this notion, arguing that children's cognitive development cannot be understood without situating it in context (Rogoff, 1990; Vygotsky, 1987). The present study will examine two dimensions of context and their association with children's engagement in SRL: physical and social. Whereas the physical context involves features of the environment, the social context includes opportunities for interactions with social partners. The current study will explore the role of both context dimensions.

Past research has found that children's SRL may be dependent on the physical context, with features of the classroom environment impacting children's regulation behaviors (Jarvela & Jarvenoja, 2011; Neizel & Connor, under review; Smit, de Brabander, & Martens, 2013; Stipek,

Feiler, Daniels, & Milburn, 1995). Additionally, there is evidence that children's use of private speech is also context-dependent, with more-structured activities providing fewer opportunities to engage in private speech than more open-ended activities (Krafft & Berk, 1998; Winsler, Carlton, & Barry, 2000). Moreover, types of private speech have been found to differ by context as well (Krafft & Berk, 1998). If private speech is in fact a successful mechanism for children's SRL, then the variation in both the amount and types of private speech by more-structured versus less-structured classroom activities may be an important determinant of how children are regulating their learning.

In addition to the role of the physical/environmental classroom context on SRL, the present study explores the role of social context as well; in particular, what impact does the presence of teachers and peers have on children's engagement of SRL through use of speech? Teachers have been found to support the emergence of children's SRL in a number of ways, including serving as an information source, scaffolding, and modeling SRL strategies, such as goal setting and evaluating one's performance (Demirtas, 2013; McTigue & Liew, 2011; Peeters et al., 2014; Perry & VandeKamp, 2000). Peers offer a source of social comparison, act as collaborators, and also engage in metacognitive dialogues with children (Iiskala, Vauras, Lehtinen, & Salonen, 2011; Neitzel & Connor, under review; Stright, Neitzel, Sears, & Hoke-Sinex, 2001; Whitebread et al., 2009). Because teachers and peers support SRL in different ways, it is important to understand how children's access to these different types of social partners affects their SRL. Much like physical context, children's social partners are also thought to impact children's use of private speech; however, past studies have yielded contradicting findings about whether the presence of social partners inhibits or encourages private speech (Berk & Spuhl, 1995; Krafft & Berk, 1998; Winsler, Carlton, & Barry, 2000).

The effect of social partners on children's private speech remains unclear. The present study seeks to understand how children's social environment affects their engagement in types of speech, and in turn, relates to their SRL.

Contribution of the Present Study

Preschool denotes an important time in cognitive development (Rogoff, 1990, Vygotsky, 1987; Winsler & Naglieri, 2003). Not only are children entering school for the first time, but this transition is met with a subsequent increase in language and other cognitive abilities. The emergence of SRL accompanies this cognitive growth (Neitzel & Stright, 2003; Perels et al., 2009). Nevertheless, most research on SRL focuses on much older children, providing little insight into the early stages of this development (Larson & Suchy, 2014; Lee & McDonough, 2015; Ohtani, Okada, Ito, & Nakaya, 2013). One reason why research has largely failed to detect SRL in young children is due to the heavy reliance on children's self-report of engagement in SRL (Lee, 2011; Metallidou, 2012; Perry, 1998; Zuffiano et al., 2013). Self-report requires elevated language skills and understanding that preschoolers have not yet acquired. As a result, I argue that young children's SRL abilities have been underestimated in past literature.

Observing these behaviors in a natural setting where they organically unfold provides a relevant alternative to better recognizing SRL in preschool children, for it allows one to understand how aspects of the physical and social dimensions of context impact these behaviors. SRL is a dynamic ability, and classroom observations can better capture its changing nature. In the present study, researchers unobtrusively observed preschool children in the classroom while they participated in everyday classroom activities in two overall settings: instruction and play. The present study examines three primary research questions:

1. How does children's proximity to social partners impact their use of private speech and social speech?
2. How does children's use of private and social speech mediate the relationship between global vocabulary and SRL in the classroom?
3. How does the relationship between speech and SRL differ by instructional context?

Chapter Summary

In summary, the present study seeks to understand what aspects of the environment are influencing children's SRL, including both physical and social dimensions of context. Additionally, the relationship between language and SRL will be explored to provide a deeper understanding of this early cognitive development, thus yielding important implications for intervention and practice. The following chapter will review relevant theoretical and empirical evidence supporting the research questions.

Chapter 2: Literature Review

1. Theoretical Framework

Social Constructivist Theory provides an appropriate lens through which to view the relationship between language and early cognitive development. Vygotsky's view of Social Constructivist Theory in particular holds that higher mental functions originate entirely through one's interactions with the social world and do not exist at birth (Vygotsky, 1978; 1987). Thus, cognitive development of the individual cannot be explained in isolation from the sociocultural context of learning. In this sense, culture shapes individual development, and thus, cognitive development differs by culture. Therefore, to understand how learning and cognition development, one must understand the physical and social environment in which they are emerging. Finally, Vygotsky's view emphasizes the role of language in early cognitive development and its link to internal thought.

Kenneth Tobin has applied the Social Constructivist framework to classroom curriculum (Tobin, 2015; Tobin & Dawson, 1992). Tobin rejects traditional curriculum reform, which emphasizes a teacher-directed approach in which teachers are viewed as transferring knowledge to students (Tobin & Dawson, 1992). Instead, he argues for the consideration of environment and culture, posited by Social Constructivist Theory (Tobin, 2015; McRobbie & Tobin, 1997). Culture creates a dynamic learning environment, and it is important to understand symbolic, social, and material resources available to students. A students' agency can only explain a portion of learning without considering the classroom environment through which it is situated (Tobin, 2015). Although his work primarily focuses on science education in high school students, Tobin has conducted some work on elementary school students (Tobin, Briscoe, & Holman, 1990), and his ideas can further be applied to early cognition and learning in the

preschool classroom. His application of Social Constructivist Theory argues that learning results from the co-construction of knowledge between the learner and the teacher within a cultural context (Tobin, 1998; Tobin et al., 1990).

Vygotsky's seminal work provides an overall framework of Social Constructivist Theory, while Tobin's contemporary approach to learning provides a direct application of the theory to the classroom setting. Thus, I will rely primarily on the work of Vygotsky and Tobin when illustrating the key tenets of Social Constructivist Theory. In particular, I will discuss three overall aspects of this theory and how they support the current study: the importance of the role of context, the contributions of social partners, and language as a learning tool.

Role of context. Theoretical support for the role of context on children's early learning is presented by Social Constructivist Theory, which holds that all learning occurs in culturally-shaped contexts (Palincsar, 1998). Moreover, Vygotsky's traditional Social Constructivist view argues that the development of the individual cannot be separated from his/her sociocultural context, and that the individual exhibits little control over the environment (Garton, 1992; Vygotsky, 1987). The institution of formal schooling in industrialized countries offers a primary example of how culture determines context. This particular context provides a unique learning experience emphasizing learning through trial and error, whereas this method would be far too costly in another context in non-industrialized countries (Rogoff, 1990). The school context also provides children with opportunities to interact with peers, in which joint activities require one to control his/her own thinking and actions, or engage in regulation of their learning (Chatzipanteli, Grammatikopoulos, & Gregoriadis, 2014; Whitebread et al. 2009).

More specifically, Tobin's Social Constructivist framework views teachers as impacting the classroom environment through the curriculum. He argues that high-control learning

contexts follow a behaviorist perspective, and do not capitalize on students' ability to contribute to their own learning (Tobin & Dawson, 1992). However, if the curriculum, and subsequently the environment, is structured in a way that allows for some student control over learning, students can then engage in a Social Constructivist approach to learning. Hence, they are afforded opportunities to further their learning through asking questions, participating in class discussion, and reflecting on their own progress. Tobin acknowledges the importance of socio-cultural influences on curriculum and thus classroom environment; cultural factors structure the curriculum above all else.

When using Social Constructivist Theory as a lens to view the relationship between language and learning, it is essential to consider the context in which these abilities are unfolding. While the classroom offers a prime example of a culturally-specific context, there is a need to examine the classroom as it changes throughout daily activities. Both children's language use and cognitive advancements may be more fluid, rather than stable characteristics, due to the dynamic environment of the classroom. By examining these shifting local contexts, we can better determine how different classroom activities promote or inhibit children's independent learning.

Role of Social Interactions. The importance of the role of others in children's cognitive development is another central assumption of Social Constructivist Theory. One such example is Vygotsky's Genetic Law of Cognitive Development, which holds that every cognitive function first appears in the social realm before becoming internalized and transitioned into the psychological realm (Palincsar, 1998; Vygotsky, 1987). This means that all higher mental functions are initially social in nature, until they are internalized or appropriated by the child. As

a result, one must consider the social environment in which cognitive abilities are emerging in order to understand how these abilities come to develop.

Social Constructivist theorists make a distinction between the role of more-skilled versus same-skilled others. Vygotsky depicted adults, or more-skilled peers, as making a critical contribution to children's cognitive development. Adults act as experts who can adjust their ease/difficulty of instructions based on the child's current understanding (Fox & Risconscente, 2008; Rogoff, 1990). Vygotsky defined the zone of proximal development as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1987, p. 86). Therefore, adults' or more-skilled peers' assistance ultimately challenges children's thinking, resulting in a higher level of learning. In that sense, the focus is placed on children's future development rather than their present development, posing the question, "what can the child potentially accomplish?" (Del Rio & Alvarez, 2007). The zone of proximal development is dynamic in that children's abilities evolve daily (Bodrova & Leong, 1996). Assistance can be given by adults or more-skilled peers in a number of ways, including offering hints, restating a question, encouraging children to state what they understand, or modeling a potential strategy. Assistance can also take the form of indirect help by creating a situation or environment that provides children with an opportunity to practice particular learning strategies. Both direct and indirect assistance involve social interactions aiding children's cognitive development (Bodrova & Leong, 1996). Cognitive development, thus, depends heavily on opportunities and the environment, both which are culturally-determined (Del Rio & Alvarez, 2007). As a result, children may have diverging

trajectories of cognitive development due to different capabilities as well as different opportunities.

Rogoff's (1990) idea of guided participation further exemplifies the role of assistance, in which intersubjectivity with an adult or more-skilled peer leads to cognitive advancement. As such, both child and adult must have a shared focus or a common goal while completing a task. Adults then can offer children both resources and support for reaching that shared goal, thus fulfilling a complementary role with the child. These interactions serve the purpose of connecting a child's current knowledge to his/her future knowledge. Guided participation functions as an extension of Vygotsky's zone of proximal development, in that learning from others also includes participation in culturally relevant activities.

In addition to adults guiding young children's early cognitive development, Social Constructivist Theory also holds that peer interactions make a significant contribution to the emergence of cognitive abilities. In particular, Piaget argued that same-skilled peers are necessary for a child to restructure his/her own thinking (Palincsar, 1998; Piaget & Inhelder, 1969; Rogoff, 1990). By same-skilled peers, Piaget is referring to peers with a similar level of cognitive development that can offer their own perspectives to the child. Peers have relatively equal levels of control over the situation, and maintaining this equilibrium requires regulation of not only one's behavior but one's thinking as well. This balance of power between peers also allows for the restructuring of one's perspectives or ideas if there is a discrepancy between oneself and his/her peer, ultimately leading to cognitive advancement.

Tobin's view of Social Constructivist Theory also maintains that same-skilled peers can make a significant contribution to early cognitive development. Language-based interactions allow students to reach a joint understanding by negotiating their differing cognitive

representations, promoting both cognitive and social development (Tobin 1993; 1998). Through these exchanges, children are constructing their own knowledge, as well as co-constructing with others, rather than simply modeling and imitating behaviors of peers. One such example Tobin provides is brainstorming, in which peers collaboratively develop ideas. New ideas either build upon or challenge past ideas. Through joint construction, peers can come to a consensus when regulating their learning, making them an essential element in both challenging and advancing their learning (Tobin, 1993).

Overall, Social Constructivist Theory offers a sophisticated explanation of the role that others play in children's early cognitive development. Others are not simply models for children to imitate; rather they have distinct roles in both challenging children's thinking and guiding their cognitive growth. To truly understand the relationship between these early cognitive abilities, one must consider the social context that the child is exposed to and how everyday interactions shape his/her learning.

Language as a learning tool. Like other forms of cognition, Social Constructivist Theory holds that children develop language through social interactions; additionally, language is a cultural tool that mediates these interactions (Fox & Riconscente, 2008; Palincsar, 1998; Vygotsky, 1987; Wertsch, 1991). While Vygotsky argued that children utilize a number of tools when co-constructing knowledge, such as imitation and play, the present study will focus primarily on language as a tool (Vygotsky 1967; 1978). Vygotsky's Social Constructivist view argues that speech organizes perception and language ultimately develops thinking as "…speech leads to the end of the formation of thinking, transfers it to a new track, converts direct, natural thinking into cultural thinking, and in this way makes it more abstract" (Vygotsky, 1987, p. 236). Accordingly, language acts as the primary mechanism for regulating one's thinking. Moreover,

Vygotsky maintained that private, or egocentric, speech is intended to assist a child's thinking, rather than to communicate with others (Vygotsky, 1987). He defined egocentric speech as occurring when "the child talks only about himself, takes no interest in his interlocutor, does not try to communicate, expects no answers, and often does not even care whether anyone listens to him" (Vygotsky, 1962, p. 15). Vygotsky argued that private, or egocentric, speech is meant for oneself, and is not directed to any particular audience. Instead, it is thought to aid children while completing a cognitive task. Private speech initially exists externally, but is internalized over time, marking the transition from speech to thought (Vygotsky, 1987). Therefore, by internalizing language, children gain control over their own thinking.

In addition to private speech, Vygotsky explained social or public speech as being meant for communication (1987). As such, these vocalizations do not develop in isolation; rather, they emerge in response or in reaction to others. Because he argues that cognition initially emerges in the external world before becoming internalized by the child, one can assume that children's engagement in social speech plays a prominent role in early cognitive development. When children are not yet capable of completing a task, they may need to rely on external sources of help provided by others. Children can access these external sources of aid through communicative language.

Tobin further explains the role of public or communicative speech in cognitive development through the concept of discourse (Tobin, 1998). Discourse is a social activity in the classroom through which students can create meaning using language. Students communicate with both peers and the teacher to compare their internal representations to that of others. Therefore, language can be used to independently construct knowledge, as well as a tool in co-

constructing knowledge in a group, exemplifying how language abilities shape early learning in various ways.

Ultimately, Social Cognitive Theory views language as being a primary mechanism for learning and development.

> "The acquisition of language can provide a paradigm for the entire problem of the relation between learning and development. Language arises initially as a means of communication…only subsequently, upon conversion to internal speech, does it come to organize the child's thought" (Vygotsky, 1978, pp. 34-35).

Therefore, understanding how language functions as a mediator for this early cognitive development is an essential component for both teacher practice and intervention.

Overall, Social Constructivist Theory provides theoretical grounding for the present study, signifying the importance of both the physical and social dimensions of context in understanding children's early cognitive development. Furthermore, this theoretical lens offers an explanation for the importance of language as a primary learning strategy during this early development.

2. Self-Regulated Learning

The term self-regulated learning (SRL) emerged in the mid-1980s in response to increasing attention to children's active engagement in learning (Zimmerman, 1986; Zimmerman & Schunk, 1989). The study of self-regulation of academic behaviors originated from the general field of self-regulation (Zimmerman & Schunk, 1989). Zimmerman (1986) argued that SRL requires three overall components for a child to take an active role in his/her own learning: metacognition (awareness of one's own thinking), motivation, and behavior. Through these interacting components, learning occurs through monitoring one's progress and setting goals in

the classroom. Children then develop strategies to meet these goals, and evaluate their performance (Zimmerman & Schunk, 1989). Self-regulated learners, in turn, develop an academic sense of self through this active progress monitoring. The purpose of SRL is for children to adapt learning and participation styles that yield positive feedback and evaluation from others (Paris, Byrnes, & Paris, 2001). This feedback is important in achieving academic success. Children are expected to behave and learn in a particular way; thus, diverging from these expectations can lead to negative academic outcomes.

Although SRL literature focuses on the child as agentive, it is essential to understand the role that others play in this development. Zimmerman and Schunk state that "the key issue defining learning as self-regulated is not whether it is socially isolated, but rather whether the learner displays personal initiative, perseverance, and adaptive skill in pursuing it" (Zimmerman & Schunk, 2001, p. 1). To that effect, understanding how SRL unfolds requires examining children in the social environment of the classroom, and not in isolation of others. Both teachers and peers impact this engagement in SRL, and it is therefore pertinent to understand precisely how others are influencing this development. Furthermore, Zimmerman and Pons (1986) specify that seeking help from others is one type of SRL strategy. Others, whether teachers or peers, can provide a model of which children can replicate, resulting in regulation of one's learning. While Zimmerman (1986) denotes the importance of classroom environment in supporting children's SRL, he argues that, "no environment ensures learning" (p. 307). This illustrates the importance of teachers in actively supporting children's development of learning strategies in addition to structuring the classroom in a way that provides opportunities for children to apply these strategies.

What leads some children to be better self-regulated learners than other children? Paris, Byrnes, and Paris (2001) present an explanation for the varying levels of SRL among individual children. Children from minority backgrounds, whether cultural or socio-economic, have an unequal availability of successful learning practices. Paris et al. argue that "preschoolers who do not practice school-like routines of joint-reading, asking and answering questions, being obedient and compliant, and sharing appropriately with others are not prepared for the demands of school and cannot participate in sustained learning-teaching episodes" (p. 256). This disconnect between expectations and classroom performance may result in disapproval from both teachers and peers. This may be particularly problematic in children from low-income families who may not be prepared to enter school. As a result, these children may be inhibited from fully participating in classroom activities, thereby impeding their development and engagement in SRL.

Development of SRL. Preschool is a period of rapid cognitive development. While children are entering school for the first time, their engagement in SRL is first emerging (Neitzel & Stright, 2003; Perels, Merget-Kullmann, Wend, Schmitz, & Buchbinder, 2009). These SRL abilities allow children to function independently in the classroom, an important indicator of school readiness (Blair, 2002; Zimmerman, 2002). Because the preschool years are such a critical time for cognitive development (Case, 1992), we must understand the relationship between language and SRL during this developmental period, including identifying what linguistic strategies children may use when regulating their learning.

While preschool children may possess the capability of engaging in SRL, not all children regulate their learning to the same extent (Neitzel & Stright, 2003). Because older children's use of SRL correlates to both their present and future academic achievement (Nangdagopal &

Ericsson, 2012; Ning & Downing, 2015; Xu et al., 2010), it is essential to identify factors underlying this phenomenon in the early stages of development, and determine why children differ in their levels of SRL. Although a number of individual differences may contribute to children's level of SRL, such as temperament and general disposition (Boekaerts & Corno, 2005; Zuffiano et al., 2013), other causal factors may exist through which one could potentially intervene, and thereby increase young children's engagement in SRL. This could, in turn, minimize academic struggles in young children, and dramatically reduce achievement gaps in elementary and middle school.

Most studies on early self-regulation exclusively focus on regulation of behavior, rather than learning (Alarcón-Rubio, Sánchez-Medina, & Prieto-García, 2014; Skibbe, Connor, Morrison, & Jewkes, 2011; Vallotton & Ayoub, 2011). These regulatory behaviors have been found to emerge around 1-3 years of age, while ages 3-6 denote a crucial time for this development (Alarcón-Rubio et al., 2014; Vallotton & Ayoub, 2011). Behavior regulation involves some of the same components as SRL, such as attention shifting and working memory; however, there is a need to examine how these specific regulation behaviors allow children to regulate their learning, thus becoming autonomous learners and classroom participants.

3. Development of Language

Language as a SRL Strategy. Language is an important predictor of academic outcomes, but one mediator of this relationship often ignored in the literature is self-regulated learning (SRL). Language abilities are important in the classroom because they allow children to ask questions, seek additional information, and participate in collaborative dialogue with their classmates, all of which are essential components of SRL (Demirtas, 2013; McTigue & Liew, 2011; Neitzel & Stright, 2003; Tobin, 1998; Zimmerman & Schunk, 2011). Therefore, if a child

must rely on language to regulate him/herself, then impaired language abilities may hinder his/her subsequent regulation.

It may be that children who have higher global language abilities rely more on verbalized regulation strategies than children with lower language abilities. Vygotsky argued that language is essential in SRL, for it allows children to identify their goals, define the features and challenges of a task and the necessary steps to complete it, and express their beliefs about their own personal abilities (Vygotsky, 1987). This linguistic property of SRL initially emerges from an external source, such as a parent or teacher, until internalized by the child who then relies on his/her own language for self-regulation. Furthermore, Luria (1961) outlined three stages of verbal SRL, in which the source of verbal regulation originates from others, then transitions to the child relying on external forms of speech, and finally results in the child using both external and internal language to regulate. Thus, both receptive and expressive language abilities yield importance in the development of SRL, for it is critical that children understand the language used by others to help scaffold them, as well as be able to accurately express themselves.

Private speech. One particular linguistic strategy involved in SRL is the use of private speech. Children often use private, or egocentric, speech to guide their regulation (Vygotsky, 1987). Private speech can manifest in numerous forms, such as clear, distinguishable discourse or audible muttering, the latter of which is thought to represent the transition from external private speech to internalized thought (Alarcón-Rubio, Sánchez-Medina, & Prieto-García, 2014; Berk & Spuhl, 1995; Fernyhough & Fradley, 2005). Empirical evidence illustrates private speech as emerging around 3 to 4 years of age, indicating the importance of preschool during the development of this linguistic strategy (Winsler, Carlton, & Barry, 2000; Winsler, Ducenne, & Koury, 2011). While private speech is thought to be universal in preschoolers, the amount of

private speech used varies greatly by individual children (Berk & Spuhl, 1995; Day & Smith, 2013; Winsler, Carlton, & Barry, 2000).

Children initially engage in private speech during the task (on-line); this may shift to occurring before the task (planning stage) as children's regulation abilities become more sophisticated (Alarcón-Rubio, Sánchez-Medina, & Prieto-García, 2014; Harris, 1990; Vygotsky, 1987). A number of studies have found that private speech peaks during the preschool years, and then subsequently decreases with age (Lee, 2011; Patrick & Abravanel, 2000; Winsler, Diaz, & Montero, 1997; Winsler & Naglieri, 2003; Zimmerman & Schunk, 2011). Private speech does not merely dissipate; rather, it becomes internalized during the elementary school years (Alarcón-Rubio, et al., 2014; Lee & McDonough, 2015; Patrick & Abravanel, 2000). Vygotsky (1987) explained this developmental change as children's egocentric speech transitioning into inner speech. Past research has revealed that the shift to internalized private speech does not occur until around 6-7 years of age (Alarcón-Rubio, Sánchez-Medina, & Prieto-García, 2014). As a result, preschool denotes an optimal developmental period for observing private speech, as it remains primarily external during this time. Thus, understanding preschoolers' use of private speech is necessary for two reasons: preschoolers may rely on private speech more frequently than older children, and private speech is more directly observable in preschoolers when the majority of this form of talk remains externalized.

Private speech and cognitive performance. Studies on private speech provide evidence of a link between language and SRL. Patrick and Abravanel (2000) examined preschool children's use of private speech during several cognitive tasks, and found that the vast majority of private speech used was self-regulatory in nature. Additionally, a study by Lee and McDonough (2015) found a positive correlation between teachers' ratings of self-regulation of

their elementary school students and students' use of private speech. A study by Lee (2011) further exemplifies the complex nature of private speech. After having 7 and 8-year-olds keep a reflective journal about their private speech use, children reported engaging in private speech for a number of reasons. While memory retention was one reported use, children also engaged in private speech to manage their emotions, problem solve, and self-regulate while completing a task.

If a link between private speech and SRL exists, private speech may contribute to regulating one's learning by alleviating cognitive load. Numerous studies have found that as tasks become more difficult and cognitive load subsequently increases, young children engage in more private speech as a result (Duncan & Pratt, 1997; Lee, 2011; Manfra & Winsler, 2006; Patrick & Abravanel, 2000). Therefore, when faced with a particularly challenging task, one might expect successful self-regulators to rely on private speech more heavily than less successful regulators. However, there is likely a limit to how helpful private speech can be. For instance, Fernyhough and Fradley (2005) found that a curvilinear relationship exists between private speech and level of difficulty of the proposed task, such that private speech peaks at intermediate levels of difficulty. They hypothesized that private speech is not needed during easy tasks, and may be ineffective when the task is too difficult. This demonstrates the importance of Vygotsky's zone of proximal development in the preschool classroom (Vygotsky, 1987). While classroom activities should pose a challenge to young children, they should not be so difficult that children are incapable of completing them. Consequently, when faced with more difficult tasks, teachers should provide children with the necessary level of support, or scaffolding, to complete it.

While young children may rely heavily on private speech when attempting a challenging cognitive task, is private speech aiding their performance? The studies examining the effectiveness of private speech on SRL and cognitive performance have revealed mixed findings. Girbau (2002) found that for older children (ages 8-10 years), use of private speech inhibits cognitive performance when working in a dyad on a collaborative task. By engaging in private speech, the child disrupts communication with his/her partner, therefore interrupting their joint progress. Several studies have found no relationship between use of private speech and cognitive performance (Larson & Suchy, 2014; Patrick and Abravanel, 2000). In particular, Larson and Suchy found that when adults increased their verbalization while engaging in a cognitive task, their speed increased but not their accuracy on the task. Finally, several studies have found positive effects of private speech on cognitive performance in preschool children; these effects increased when scaffolded by an adult (Berk & Spuhl, 1995; Winsler, Diaz, & Montero, 1997; Winsler and Naglieri, 2003). Further evidence of the usefulness of private speech is provided by Lidstone, Meins, and Fernyhough (2010), who found that having children suppress private speech by asking them to repeat a series of words resulted in impaired performance on a cognitive task. It may also be that type of private speech determines whether or not it is beneficial to the individual, rather than amount of private speech. For instance, one study found that off-task private speech had detrimental effects on task performance (Alarcón-Rubio, Sánchez-Medina, & Prieto-García, 2014). Perhaps individual children do not only differ in their use of private speech, but also in the effectiveness of their private speech.

Due to these contradicting findings, the relationship between private speech and SRL remains unclear. Perhaps externalized private speech is a more effective regulation strategy in younger (preschool) children, while it is relatively ineffective in older children who rely on more

internalized forms of private speech which are more difficult to measure. Also, private speech may only be helpful when enacting particular regulation strategies that do not involve the participation of others. Similarly, type of private speech may be important as well, with off-task speech possibly distracting children from the task at hand. Regardless, a clear illustration of the role of language on children's SRL strategies is needed, especially in young children who likely have a stronger reliance on verbalizing their thoughts.

Private speech and context. While private speech is thought to universally develop in preschoolers, children's engagement in private speech may be context-dependent (Krafft & Berk, 1998; Winsler, Carlton, & Barry, 2000). Krafft and Berk found that private speech was more prevalent in open-ended activities, such as fantasy play. As such, classrooms structured around more open-ended activities appeared to promote higher levels of overall private speech when compared to more structured classrooms offering limited opportunities for open-ended activities. Additionally, Winsler et al. (2000) found that self-selected activities in the classroom resulted in higher levels of private speech than both large group and outside play contexts, especially when it involved a goal-directed activity. Not only does context determine the amount of private speech used, but also the type of private speech. Krafft and Berk (1998) found that closed-ended activities resulted in private speech focusing on self-guidance, whereas opened-ended activities promoted higher levels of fantasy private speech in which children intended to maintain the pretend play session. From these findings, it is apparent that the type of classroom activities may be an important factor in determining children's amount and function of private speech.

Private speech and social partners. In addition to context, children's social partners have been linked to children's engagement in private speech; however, the exact role of social partners has been disputed (Berk & Spuhl, 1995; Krafft & Berk, 1998; Winsler, Carlton, &

Barry, 2000). Winsler et al. (2000) found that preschoolers engaged in the highest levels of private speech when alone, followed by in the presence of peers, and lastly in the presence of a teacher. This suggests that social partners may actually inhibit children's reliance on private speech. Conversely, Krafft and Berk (1998) found that when interacting with peers, children's use of private speech increased as compared to when they were alone. This implies a social nature of private speech, and how this linguistic behavior may be promoted through social interactions.

Social partners may impact children's future private speech in addition to their concurrent private speech (Berk & Spuhl, 1998). One such example is presented by Berk and Spuhl's study on parenting styles and children's private speech. They found that children with authoritative mothers exhibited higher levels of task-relevant private speech, whereas children of authoritarian mothers exhibited higher levels of task-irrelevant private speech. From these studies, it is apparent that social partners play a distinct role in children's selection and employment of private speech strategies; however, how social partners promote these strategies is still unclear.

Social speech and SRL. While private speech may be a useful tool in independently regulating oneself, social or communicative speech may allow children to better engage in social forms of regulation, such as seeking help from others or probing for more information. One such form of social regulation is scaffolding from a more-skilled other, which typically takes on the form of a linguistic exchange (Vygotsky, 1987; Zimmerman & Schunk, 2011). Additionally, language is crucial when children engage in help-seeking from others (Demirtas, 2013; McTigue & Liew, 2011; Newman, 2000; Rice, 1989). It is important for independent learners to recognize when a task is too difficult to complete on one's own (Newman 2000; 2002). As a result, children can ask for help from either a teacher or peer (Newman, 2000). These interactions

require the effective use of language, for children must successfully depict their needs to another person, and understand the help being offered in return (Newman, 2000). This emphasizes the importance of both expressive and receptive language abilities in children when seeking help from others. Children who often seek help from teachers have been found to be more successful students than those who do not (Demirtas, 2013). Therefore, children who can better articulate their needs will be more successful in securing the help they need from others. Receiving such help enables children to learn independently (Newman, 2002). This social regulation strategy still involves the active role of the child, for he/she has to take the initiative to seek assistance from others. This exemplifies one way in which SRL does not occur in isolation; it is essential that children utilize the social resources of the classroom when regulating their learning.

Another potential use of social speech is social comparison. Classrooms provide ample opportunities for students to engage in social comparisons, and children as young as preschool-age have been found to utilize this strategy (Butler & Ruzany, 1993; Chafel, 1984; Dijkstra, Kuyper, van der Werf, Buunk, & van der Zee, 2008). One primary reason for social comparison is self-evaluation (Chafel, 1984). By comparing oneself to his/her peers, one is able to determine his/her relative success in relation to others in the class, one form of social regulation. Social speech, although understudied in the literature, may be one vehicle for making these comparisons. If children have the linguistic abilities to verbalize their standing relative to their peers, than they may be better able to address any shortcomings of their own performance.

Children also use language to engage in and maintain metacognitive dialogues with others. Such dialogues require one to rely heavily on language, for it involves a bi-directional interaction between both parties (Moos & Ringdal, 2013; Perels et al., 1999). That is, children participate in the dialogue rather than simply passively listening to the teacher or other social

partner. Such reciprocal conversations require children to be able to successfully communicate with others as well as understand their social partners' communication, identifying the need for both expressive and receptive language skills for engaging in this type of verbal exchange.

Ultimately, language may be used as a tool to independently regulate through private or egocentric speech directed towards oneself, and to socially regulate through social or communicative speech directed towards others. The role of language in children's SRL still needs to be examined systematically to determine if language abilities predict use of verbal strategies (both private and social speech), and if so, does this result in higher levels of SRL?

Global language abilities and SRL. The relationship between overall language abilities and private speech is underrepresented in the literature. Only a couple of studies have considered global language scores' impact on private speech (Berk & Spuhl, 1995; Manfra & Winsler, 2006; Fernyhough & Fradley, 2005; Winsler et al., 1997), and none, to my knowledge, have looked at private speech as mediating the relationship between global language abilities and SRL. The studies that have been conducted have presented mixed findings of the impact of language abilities on the use of private speech. Manfra and Winsler (2006) found that children's expressive language was associated with higher awareness of their own use of private speech. Subsequently, children with higher awareness tended to use more relevant private speech than those with lower awareness; however, there were no differences in amount of private speech. Fernyhough and Fradley (2005) found no relationship between preschoolers' receptive vocabulary and use of private speech while completing a task. Conversely, Berk and Spuhl (1995) found that receptive vocabulary predicted partially internalized private speech during task performance. Perhaps receptive vocabulary is linked to more advanced stages of private speech when internalization is beginning.

Past research has identified the importance of early vocabulary skills in predicting academic performance and classroom behavior (Hart & Risley, 1995; Morgan, Farkas, Hillemeier, Hammer, & Maczuga, 2015; Vallotton & Ayoub, 2011). Morgan et al. argue that by two years, a significant gap already exists in the vocabularies of low-income children as compared to middle-class children. By three years, children's amount of talk, vocabulary growth, and interaction styles are thought to be relatively stable, and a strong predictor of language abilities at ages 9-10 (Hart & Risley, 1995). Beyond strictly language development, these early vocabulary skills have been found to predict children's future global academic performance, including children's reading and math achievement (Morgan et al., 2015). While the impact on SRL has not been studied directly to my knowledge, there is evidence that higher vocabulary abilities are linked to increased behavioral self-regulation and fewer internalizing and externalizing problems in the classroom (Morgan et al., 2015; Vallotton & Ayoub, 2011). These findings yield support for the hypothesized link between global vocabulary and SRL in the classroom.

From these studies, there appears to exist an association between children's language abilities and their engagement in private speech. However, this relationship must be examined more in depth, for past studies have yielded mixed results. There is also support for the association between early vocabulary abilities and later academic performance. Additionally, there is minimal evidence for the link between language abilities and children's subsequent levels of behavior regulation. How children's use of private speech mediates the relationship between global language abilities and SRL is still unknown.

4. Context

As mentioned earlier, one of the central tenets of Social Constructivist Theory is the importance of context in explaining children's early cognitive development. Using this theoretical lens, one cannot simply ignore the effects of changing contexts on development, treating SRL as a static, unchanging trait. An examination of SRL in relation to three overall contexts follows, beginning from the broadest context to the narrowest. The three contexts include environmental context (changing activities in the classroom environment), the social context (children's interactions with others), and individual child context (low socioeconomic status).

Environmental context. In addition to the need to understand how SRL functions in low-income children, there is also a need to examine how children modify these cognitive abilities depending on their present environmental context. How do features of the environment and the demands of the current situation determine the strategies young children use to regulate their own learning? In particular, how does SRL function in more-structured (teacher instruction) vs. less-structured (child-centered play) classroom activities? Past research has typically examined SRL at a single time point, offering only a snapshot of this phenomenon. By ignoring how SRL may differ across time and context, SRL is then assumed to be a stable, unchanging trait. Overlooking the fluid nature of this ability limits our understanding of how it develops.

Past research yields evidence that SRL is dynamic in nature, and different contexts elicit diverse regulation behaviors (Jarvela & Jarvenoja, 2011; Neitzel & Connor, under review; Smit, de Brabander, & Martens, 2013; Stipek, Feiler, Daniels, & Milburn, 1995; Vassallo, 2012, 2013; Whitebread & O'Sullivan, 2012). Even within the classroom environment, different

instructional contexts provide various opportunities for students to engage in SRL. Studies have found that classrooms emphasizing social climate over academic performance, and those that allow students to assume an active role in their learning rather than be a passive recipient, elicit higher levels of SRL behaviors (Smit et al., 2013; Stipek et al., 1995). This illustrates the importance of the classroom environment in promoting or hindering children's SRL abilities. Additionally, there is evidence that students' SRL use changes within the same classroom, due to the contextual cues in the environment (Neitzel & Connor, under review). Within a classroom, the instructional context is modified throughout the day, including contexts where learning is more teacher-directed versus student-centered. Students appear cognizant of these contextual fluctuations, altering their SRL strategies accordingly. Since SRL appears to be an evolving ability, changing both over time and across contexts, it is pertinent to understand what environmental features impact students' use of SRL strategies. Likewise, children may utilize different types of language or speech as a regulation tool depending on the characteristics of the local environment. If certain contextual cues are more likely to elicit elevated SRL, then teachers may be able to purposefully construct the classroom environment to support this emergence.

In addition to classroom activities, the quality of the learning environment has also been identified as a predictor of effectiveness of SRL (Ning & Downing, 2015). In particular, high teaching quality characterized by providing students with clear goals, proper assessment, and appropriate work load was linked to more competent SRL in students. Thus, it is essential to consider the learning environment when examining the stability of students' SRL strategies in the classroom. Aspects of the learning environment may provide opportunities for students to

enact certain strategies, thereby fostering SRL. By pinpointing what contexts are beneficial to SRL, we can better promote this development in young children.

Role of teachers and the physical environment. Teachers are largely responsible for structuring the environment of the classroom; thus, it is important that a teacher manages the classroom in a way that provides students with an environment facilitative of SRL (Evertson & Weinstein, 2006). Teachers can modify the learning environment to support children's cognitive growth, such as encouraging learning through participation in small group activities (Bodrova & Leong, 1996). As such, teachers provide indirect help to children through the organization and structure of the classroom. Graue, Whyte, & Karabon (2015) argue that teacher flexibility, or improvisation, is an essential component for supporting children's cognitive development: "teachers improvise when they actively respond to children's diverse, intellectual, social, and emotional experiences and needs; taking multiple bodies of knowledge into moment-to-moment interactions with children" (Graue et al., 2015, p. 14). This extended view of ways teachers scaffold children's learning is a further elaboration of Vygotsky's zone of proximal development, which requires a teacher's ability to adjust to the particular needs of individual children, while simultaneously acknowledging a child's unique resources or strengths and capitalizing on them.

Cuffaro's (1995) interpretation of Dewey's earlier work argues that space, materials, and time are three overall important components of the physical environment that are determined by the teacher. She presents Dewey's argument that the environment should promote two behaviors in children: free movement/activity and shared activities with peers. Through these behaviors, children actively explore their environment and communicate and interact with peers. The way in which a teacher uses the space of a classroom can either support or hinder these behaviors.

Teachers also provide materials in the classroom that afford opportunities for children's engagement and subsequent learning. Not only can children use materials in a closed-ended way, for the purpose that the materials were intended, but they can also use materials symbolically to represent something else. Much like space, materials should encourage children's active engagement and interaction with peers. Finally, Cuffaro includes Dewey's argument for the importance of time provided by the teacher. Teachers should consider offering enough time for children to fully engage in activities, creating fluid experiences for children.

While space, materials, and time are essential components of the physical environment of the classroom, one particular way that teachers can utilize these aspects to create a classroom environment supportive of SRL is through the use of external mediators (Bodrova & Leong, 1996). Examples given by Bodrova & Leong include displaying a daily schedule in the classroom for children to refer to and the use of songs or rhymes to indicate transition periods to different activities (e.g., song for clean-up time). These external mediators structure the classroom in a way that provides children with clear expectations for their behavior and performance. As a result, children can monitor their own progress to determine whether or not their performance matches particular expectations. Another aspect of the physical environment that may be related to SRL is teacher proximity. Test & Cornelius-White (2013), found that teacher proximity supports children's engagement in the current task above and beyond teacher-child communication. Additionally, Hester, Hendrickson, & Gable (2009) found that teacher proximity to the child positively predicted improvements in behavior regulation, particularly when the teacher offered positive feedback to the child. It is possible that the effects of teacher proximity may extend beyond regulation of behavior to regulation of one's learning as well.

Role of play. One classroom context that may uniquely support children's development of SRL is play. Dewey (1916) stressed the importance of play in the daily school curriculum for young children, arguing that play helps children better manage their learning. Thus, play and work should correspond, rather than compete or replace one another. Cuffaro (1995) interpreted earlier works of Dewey, echoing his argument for play's essential place throughout the school day. She stated, "one of the most profound means available to children and reconstructing experience, formulating and reformulating their experience is through play" (pp. 79-80). Cuffaro acknowledged the significance of both materials and space in children's ability to take advantage of play situations. When given the proper tools, children can create open-ended, imaginary scenarios without restrictions, an aspect of play that both Dewey and Cuffaro argued as being crucial.

Parten (1932) was the first researcher to distinguish between different types of play: unoccupied behavior, solitary play, onlooker behavior, parallel play, associative play, and cooperative play. She suggested that a developmental hierarchy of play exists, in which the more advanced types of play (associative and cooperative) do not emerge until the preschool years. Rubin, Maioni, & Hornung (1976) further explored Parten's play typologies, noting overall differences between middle-class and low-income preschoolers. In particular, middle-class children exhibited higher levels of the more advanced associative and cooperative play, while low-income children exhibited higher levels of parallel play. This suggests that along with other forms of cognitive development, low-income children may experience a different developmental trajectory regarding play than middle-class children. Bruner (1983) further distinguished between constructive play (e.g. finger-painting) and free play. The former allows children to make something, but is not as open-ended as free play. The open-endedness of play

is what keeps the child's attention, allowing for numerous possibilities and outcomes. This freedom ultimately promotes children's use of creativity and imagination. Ultimately, play leads children's development through this use of imagination and thinking, requiring children to follow a set of rules, and thus inhibit immediate impulses (Bodrova and Leong, 1996; 2003).

Children's learning that occurs during play may be just as important as their learning through more formal instruction. Both Montessori and Piaget argued that play is the work of the child (Montessori, 1995; Piaget, 1951). Thus, it is important to consider the learning opportunities provided by play that more structured activities may not afford. Bruner (1983) argues that play provides children with a prime opportunity for learning through exploration; during play, children do not experience serious consequences for making mistakes. Therefore, learning occurs through trial and error (Bruner, 1983; Cuffaro, 1995). Play also offers children opportunities to engage in more complex language through collaborative dialogue created with peers (Bruner, 1983). Additionally, play is critical for social development, providing a social medium for interactions with peers (Coplan & Arbeau, 2009). One such vehicle for these social interactions is sociodramatic play.

Regarding sociodramatic play, Piaget specified the importance of symbolic play in young children's cognitive development, stating that

> "It is indispensable to his [the child's] affective and intellectual equilibrium, therefore, that he have available to him an area of activity whose motivation is not adaptation to reality but, on the contrary, assimilation of reality to the self, without coercions or sanctions" (Piaget & Inhelder, 1969, p. 58).

He further stated that language is the primary tool through which children engage in this symbolic play. Vygotsky echoed this notion of the importance of play, denoting play as the

leading activity through which the child develops (Vygotsky, 1987). He stated that "in play a child always behaves beyond his average age, above his daily behavior. In play it is as though he were a head taller than himself" (Vygotsky, 1978, p. 102). For a child to remain in a play episode requires that he/she to continuously enact a particular role. In another context, this sustained enactment may be far too difficult; however, a play episode provides a script for how to act, situating and making this continued interaction attainable to young children. As such, play utilizes the zone of proximal development, wherein a child has the potential to reach higher levels of development through imitation of cultural models. Sociodramatic play involves children's use of resources to symbolically represent cultural tools through imagination (e.g., using a block as a hammer) (Elias & Berk, 2002; van Oers, 2003). Moreover, other children may also act as resources, providing a form of social support in the child's creation of an imaginary scenario (van Oers, 2003).

Past research has found a link between children's engagement in sociodramatic play and subsequent self-regulation (Elias & Berk, 2002; Meyers & Berk, 2014). This type of imaginative play evolves over the preschool years and requires children to not only control their thinking, but emotions and behavior as well, all important aspects in the broader definition of self-regulation (Meyers & Berk, 2014). This involves creating and adhering to social rules to continue the game. Elias and Berk (2002) found that preschoolers' involvement in collaborative sociodramatic play positively predicted their future self-regulation in the classroom, evaluated by their behavioral control and attention during clean-up time. They attributed this link to the control needed by children to jointly construct and follow social norms. Conversely, solitary sociodramatic play negatively predicted self-regulation. These findings depict that the benefits

of sociodramatic play may be derived from the effects of collaboration, rather than symbolic play alone.

Social context. In addition to environmental context, social interactions heavily impact children's use of SRL. Whereas children can choose to independently monitor their own work, they can also refer to others as either an example of regulation by social comparison, or for help in regulation (Neitzel & Stright, 2003; Stright, Neitzel, Sears, & Hoke-Sinex, 2001; Whitebread et al., 2009). To that extent, teachers and peers may offer unique contributions to children's development of SRL.

Role of teachers. Teachers are thought to act as the primary form of instruction in the classroom setting; however, this instruction may drastically differ across classrooms. For example, teachers may create a classroom environment that can either promote a didactic or student-centered atmosphere (Fisher, 1998). Whereas the former affords teachers more control over learning, the latter allows children to become more actively involved in the instruction.

Learning constitutes a bi-directional process between students and teachers. Teachers provide information to students, but students also elicit information through asking questions and probing for more information (Boekaerts, 1999). Teachers can promote SRL in a number of ways, including scaffolding students and encouraging them to engage in more difficult tasks that will challenge their thinking (Perry & VandeKamp, 2000). Thus, student-teacher interactions are essential in the emergence of SRL in the classroom, for they educate students to become autonomous thinkers. Teachers can also foster SRL through initiating forethought and self-reflection of students' actions, targeting the pre-action and post-action phases of SRL (Moos & Ringdal, 2012). This can be implemented through metacognitive dialogues between the teacher and student, in which the teacher addresses the student's cognitive processes, making the

student's thinking more concrete and observable to him/her (Perels, Merget-Kullmann, Wende, Schmitz, & Buchbinder, 2009). Teachers can model SRL strategies for students by setting goals, monitoring on-line progress, and evaluating students' performance, thereby making the different steps of SRL explicit to students (Peeters et al., 2014). Additionally, teachers act as an information source for children, with one SRL strategy being to seek further assistance from teachers (Demirtas, 2013; McTigue & Liew, 2011; Perry & VandeKamp, 2000).

A key to leading the cognitive restructuring in the child is the more-skilled teacher's awareness of the child's needs. Wood, Bruner, and Ross (1976) referred to this assistance in the zone of proximal development as scaffolding. They argued that an essential component of scaffolding was that the more-skilled teacher must provide levels of assistance relative to the child's needs. As the child becomes more capable of completing a task, the teacher then minimizes the amount of assistance given, transferring responsibility to the child. In assisting the child, the teacher is not simply interested in the child's success in solving the problem or completing the task, but how he/she came to find the answer (Bruner, 1996). Thus, children, like adults, are viewed as possessing the ability to reflect on their own thinking and make adjustments when necessary.

Several studies exemplify this intricate function of adults' scaffolding of children's SRL (Winsler, Diaz, & Montero, 1997; Xu, Benson, Mudrey-Camino, & Steiner, 2010). Winsler et al. (1997) examined the effect of adults' scaffolding on preschoolers' use of private speech while completing a perceptual dimension task. They found that on trials following scaffolding by the experimenter, children were more likely to succeed if they used private speech. These findings support Vygotsky and Rogoff's beliefs that scaffolding by a more-skilled peer/adult may lead to cognitive improvements.

Xu et al. (2010) provide further insight into the complex nature of adult scaffolding. Specifically, they assessed the link between parental involvement in the home, and 5th graders' subsequent SRL in the classroom. They found that parental involvement variables, including parent-child communication, parental school involvement, and parental education experiences, significantly predicted children's SRL. Therefore, parents influence children's SRL above and beyond simple modeling and verbal instruction.

Through these various types of interactions, teachers support children's engagement in SRL when the child is unable to independently monitor his/her own work. Examining how children utilize teachers as an external source of support is critical in understanding the social aspects of SRL in the classroom.

Role of peers. Within the classroom environment, peers serve as an important influence, both as sources of additional information and models of SRL. When children do not have the ability to independently monitor their learning in a particular situation, they can refer to peers through social comparison and regulate their own learning accordingly (Neitzel & Stright, 2003; Neitzel & Connor, under review; Stright, Neitzel, Sears, & Hoke-Sinex, 2001). As such, children can compare their progress or performance to that of peers as a way of evaluating their own work. Children also act collaboratively with peers to solve joint problems (Iiskala, Vauras, Lehtinen, & Salonen, 2011; Jarvela & Jarvenoja, 2011; Larkin, 2010; Shamir, Mevarech, & Gida, 2009). Through this collaborative learning, children practice their own SRL skills through metacognitive dialogues, discussing their own ideas and theories with their peers (Whitebread et al., 2009). These metacognitive dialogues do not require that children be engaged in an instructional activity; rather, metacognition can emerge through pretend play, which requires children establish and maintain social pretense to continue the game (Fox & Riconscente, 2008;

Krafft & Berk, 1998). Because play has been argued as a leading activity in preschoolers, these opportunities for interactions with peers in less structured contexts provide a chance for children to practice these emerging cognitive abilities on a daily basis (Bodrova & Leong, 1996). The classroom environment provides a unique experience, in that children are afforded ample opportunities to practice this collaboration, but are also given more formal guidance from the teacher when necessary.

Children have a number of resources available in the classroom to help them regulate their learning, including relying on teachers and peers. Therefore, acknowledging how children utilize these social interactions in their own regulation is pertinent to understanding how social context affects SRL.

Importance of Low-Income Sample. While children may regulate to different degrees, one personal factor linked to SRL is socioeconomic status (SES). Past research has found that children from low-income families exhibit lower SRL abilities than middle-class children (Vassallo, 2012; 2013). This may result from a number of interacting components. SRL, like other cognitive abilities, first emerges in the home, and children from low-income families likely have fewer opportunities to practice these emerging SRL skills (Hoff, 2013; Reilley et al., 2010).

In addition to general cognitive delays, children from low-income families are at increased risk for early language deficits (Hoff, 2013; Linver, Brooks-Gunn, & Cohen, 2002). These decreased language abilities are in part the result of lower levels of maternal education, and thus, lower levels of maternal language input (Hoff, 2013; Pungello, Iruka, Dotterer, Millis-Koonce, & Reznick, 2009; Reilley et al., 2010). This is highly detrimental, for parents are typically children's first instructors of language (Reese, Sparks, & Leyva, 2010). Consequently, children receive less diverse language exposure as well as fewer opportunities to engage in

reciprocal conversations. Thus, this language delay is two-fold: children from low-income families do not receive adequate language input in the home and are unable to practice their own emerging language skills. Additionally, children from low-income families are less likely to have cognitively stimulating activities available in the home, such as picture books, one potential mediator of the effect of SES on language development (Linver, Brooks-Gunn, & Kohen, 2002).

This early language deficit is problematic for a number of reasons. First, language delays predict a host of long-term academic deficits, including literacy skills and mathematic abilities, as well as high grade retention rates and lower high school graduation rates (Reilley et al., 2010; Brooks-Gunn & Duncan, 1997). Thus, children who enter preschool already falling behind have the odds stacked against them. In addition to academic problems, language deficits also predict social and emotional problems, such as peer rejection and externalizing behaviors (Menting, vanLier, & Koot, 2011). Children with impaired language skills have trouble communicating with others which leads to frustration, subsequently placing them at risk for social isolation. There is also evidence that low-income children may experience a developmental delay in the emergence of private speech; however, findings suggest that private speech serves the same regulatory purpose in low-income and middle-class children (Berk & Garvin, 1984). Although private speech appears to be an effective cognitive tool for low-income children, the delay in this ability could hinder their classroom learning.

In addition to early home life, classrooms and schools of low-income children often drastically differ from middle-class children. Research supports the importance for high quality preschool for low-income children, yielding evidence of gains in language and literacy that extend beyond the preschool years; however, these children still underperform when compared to middle-class children (Hammer, Farkas, & Maczuga, 2010).

Because low-income children have shown impairments in cognitive abilities, it is essential to identify which SRL strategies are successful in these children, and how language mediates these regulation outcomes. We can then better intervene in promoting SRL, and helping children avoid falling behind in school. Such an intervention could target students' overall approaches to learning, and thus have lasting protective effects against the achievement gap.

Linguistic strengths of low-income children. While past research points to low-income children as falling behind middle-class children with regards to their language ability, it may be that low-income children simply have different linguistic strengths, and these abilities should be capitalized on. While there is a gap in the literature pertaining to linguistics strengths in low-income children, a number of studies have yielded evidence that the subset of low-income African American children, in particular, exhibit unique linguistic abilities regarding narrative development (Craig & Washington, 2006; Craig, Zhang, Hensel, & Quinn, 2009; Curenton, 2011; Gardner-Neblett, Pungello, & Iruka, 2012). Specifically, African American children showed elevated levels of narrative production and comprehension when compared to their European American classmates, especially in terms of understanding character motives and intentions (Curenton, 2011; Gardner-Neblett et al., 2012). This illustrates not only the strong linguistic abilities, but cognitive abilities displayed by these children. However, these narrative abilities often do not transfer into reading and literacy skills. One hypothesized reason for this inconsistency is African American children's use of African American English (AAE), a culturally-based dialect with systematic differences from formal English (Craig & Washington, 2006; Craig et al., 2009). Because classroom assessment of reading ability focuses on formal English rather than informal vernacular, these children's true language abilities go unrecognized.

Craig et al. (2009) found that children who were able to engage in dialect shifting when completing literacy activities performed above those who were unable to deviate from AAE. Although the strengths mentioned above have been specific to low-income, African American children, these findings illustrate the importance of identifying linguistic strengths of low-income children in general, and developing more appropriate assessments of their language abilities. Additionally, the literature does not suggest that all African American children are from low-income backgrounds; rather, past research is limited in scope to focusing particularly on the linguistic strengths of low-income, African American children as opposed to a more general population of low-income children. By identifying these strengths in a more general population, teachers can be better prepared to adapt the curriculum to suit these children's learning styles.

One potential problem may lie in the ways in which low-income children's academic abilities are assessed. In particular, researchers argue that there exists a discontinuity between low-income children's true cognitive skills and those skills measured through classroom/school evaluations (Avineri et al., 2015; Miller & Sperry, 2012). As a result, these children's academic abilities are often misrepresented. An additional problem results from the mismatch between low-income children's experiences in the home and in the classroom (Miller & Sperry, 2012). Whereas middle-class children experience continuity between home and school, low-income children's experiences have been shown to be much more disjointed. These findings have strong implications for how teachers are assessing low-income children's performance, and suggests that a more accurate representation of their true abilities is needed.

5. Methodology

Shortcomings of Past SRL Studies. Researchers have primarily operationalized SRL strategies through forms of self-report. Most often, students have completed questionnaires in

which they rated their SRL strategy usage on a Likert scale (Barnard-Brak, Paton, & Lan, 2010; Heikkila & Lonka, 2006; Ning & Downing, 2015; Vermetten, Lodewijks, & Vermut, 2001; Yip, 2009). These questionnaires often target frequency of particular SRL strategies, such as organizing, environmental structuring, memorizing, and seeking social assistance. This allows researchers to tease apart the larger concept of SRL to understand what specific strategies students engage in. Another form of self-report has been elicited through interviews that present students with different learning scenarios. Students then report the SRL strategies that they would enact in each situation (Metallidou, 2012; Nandagopal & Ericsson, 2012). This provides insight into how contexts elicit SRL strategies that can be generalized across different students/classrooms/schools. A third form of self-report is the use of daily diaries, in which students regularly report what SRL strategies they had engaged in that day, a less structured way of eliciting regulation information (Nandagopal & Ericsson, 2012). Although students' daily experiences will differ from one another, daily diaries better portray what SRL activities students will typically engage in throughout the day. That is, findings may be less generalizable across students, but likely more representative of the student's actual SRL use, for it does not impose an artificial structure on the student.

While self-report studies have provided important implications for SRL, there exists a sizeable gap in the literature pertaining to direct observations of SRL in the classroom. One limitation of self-report is that students may not be aware of all the ways in which they regulate their own learning, or they may over-report their strategy use. This illustrates the need to collect information on SRL through direct observations of strategy usage that could provide a more comprehensive picture of how SRL unfolds in the classroom environment. This is especially true when examining SRL in young children. Self-report requires elevated language skills and

understanding that preschoolers have not yet acquired. Preschool children may not be aware of their regulation usage, or may simply not be able to verbalize how they regulated their learning. In addition to self-report, teacher reports of children's SRL has been widely used (Pratt, Lipscomb, & McClelland, 2015; Xu, Benson, Mudrey-Camino, & Steiner, 2010). Because teachers' attention is spread out across a number of students, this may not be the best method for accurately portraying a child's true regulation abilities. As a result, observational findings on young children's SRL may yield different results than studies operationalizing SRL through self-report.

While there are several past studies that have not relied on young children's self-report, they have given children a particular cognitive task to complete, such as a spatial-recognition, story-sequencing, or a memory task, while the experimenter assesses children's engagement in SRL (Duncan & Pratt, 1997; Girbau, 2002; Patrick & Abravanel, 2000). Although this may be a better representation of young children's SRL abilities than relying on self-report, this still imposes an artificial structure, even when conducted in a natural setting such as the home or classroom. In doing so, past research has widely ignored the role of context on children's SRL, and instead has examined regulation in isolation from everyday activities. This eliminates the ability to understand how both the physical environment and social interactions impact children's selection and enactment of regulation strategies.

A solution for recognizing the fluidity of SRL across the changing contexts of the classroom involves conducting naturalistic observations in the preschool classroom. Observational studies that have been conducted have typically focused on behavior or emotion regulation rather than regulation of learning (Denham et al., 2003; Schmitt, Pratt, & McClelland, 2014). Other observational studies have observed teachers and students in the classroom after

teachers received specific training for promoting SRL (Perels, Merget-Kullmann, Wende, Schmitz, & Buchbinder, 2009; Whitebread et al., 2009). As a result, there is still a substantial gap in the literature regarding naturalistic observations of preschoolers' use of SRL in the classroom without intervention. By conducting observations, the proposed studies will provide a more accurate view of SRL as it spontaneously occurs during everyday classroom activities. Consequently, the findings will yield stronger implications for intervention and practice, for the influence of classroom activities and both peer and teacher interactions will be considered.

Another shortcoming of past research methodologies involves the measurement of SRL. Past studies that have defined categorizations of SRL typically identified students by their presence or absence of regulation, comparing regulators to non-regulators (Heikkila & Lonka, 2006; Vermetten, Lodewijks, & Vermut, 2001). These findings identify individual children by the amount of regulation they engage in, rather than the specific regulation strategies they enact. There is still a need to examine which particular regulation strategies are supported by aspects of the physical environment and children's own linguistic strategies.

Chapter Summary

In summary, Social Constructivist Theory provides a lens through which to view the current study due to the framework's focus on the importance of context, social interactions, and language on cognitive development. Thus, the present study seeks to examine the role of language on children's SRL, as well as how this relationship is affected by both the physical and social dimensions of the classroom context. Additionally, this study addresses this early development in a particular sample: low-income preschoolers. Because low-income children's language and SRL abilities are often reported as below average, understanding how these behaviors emerge in the classroom is pertinent to intervention. The next chapter will discuss the

specific research questions to be addressed, as well as the methodology used throughout the data collection process.

Chapter 3: Purposes and Procedures

Purpose of the Present Study

The purpose of the present study is to detect potential influences on preschoolers' self-regulated learning (SRL), therefore having important implications for early childhood education. By pinpointing what contributes to children's regulation strategy selection and enactment, teachers can more effectively promote children's use of SRL in the classroom. Specifically, I will examine the role of language in SRL. The study will explore two general regulation strategies: independent regulation, in which the child independently monitors his/her own progress, and social regulation, in which the child compares his/her work to the work of peers or seeks further assistance from others, thereby using an external source to aid in regulation. Additionally, the present study will explore the role of private speech, speech directed at oneself, and social speech, speech directed towards others, on regulation strategy selection. Children's reliance on speech while engaging in SRL may be related to their overall language abilities. If speech use is linked to SRL, then we might expect children with higher language abilities to be more competent self-regulators.

Research Questions

The present study addresses three overall research questions:

1) How does the presence of social partners (peer vs. teacher) impact children's use of private speech and social speech? I hypothesize that children's use of both private speech and social speech will differ depending on whether they are alone, in the presence of peers, or in the presence of a teacher.

2) How does children's use of speech (private vs. social) mediate the relationship between global vocabulary and SRL, as measured by receptive and expressive vocabulary? (See

Chapter 2: Berk & Spuhl, 1995; Fernyhough & Fradley, 2005). There are four hypotheses related to this question:

a) I hypothesize that children who use higher rates of private speech will engage in independent regulation more often than children who use less private speech. Conversely, children who exhibit high rates of social speech will likely engage in social regulation more often than those who exhibit low rates of social speech.
b) I also hypothesize that children with higher global vocabulary abilities will, in general, utilize verbalization strategies more often when regulating than those with lower language abilities.
c) Additionally, children with higher global vocabulary abilities will be higher regulators than children with lower language abilities, especially regarding the social regulation strategy which necessitates verbal abilities to communicate one's need for help to others.
d) Ultimately, I predict that children's use of speech will mediate the relationship between global vocabulary abilities and overall SRL: higher vocabulary abilities lead to increased use of speech, which results in elevated levels of SRL.

3) In what ways does the relationship between speech and SRL differ by instructional context (play vs. instruction)? I hypothesize that the function of speech on children's regulation will differ between two overall classroom contexts: play vs. instruction.

Whereas most studies have relied on a controlled laboratory setting, or have imposed an artificial structure by having children participate in a predetermined task to induce SRL, the present study includes behavioral observations *in situ* to understand how children typically engage in SRL in their preschool classrooms. If children's overall language ability relates to their speech use, than language abilities may be a unique predictor of SRL. Identifying the nature of the relationship between language abilities, use of speech, and SRL is critical in

developing an effective way to promote SRL in young children, and thereby potentially limiting future academic deficits.

Head Start

Data were collected at a Head Start center in a southeastern city in the United States. Head Start offers a comprehensive preschool program for children from low-income families. Head Start emphasizes the well-being of the whole child, focusing on promoting children's physical, social, and emotional health in addition to academic development and school readiness. Head Start strongly encourages parental involvement and offers a number of services for children, such as medical exams, daily nutritious meals, developmental assessments, dental check-ups, center-based services for children with disabilities, and transportation to and from the center (County Community Action Committee Report, 2015).

The Head Start center (see Figure 1 below) from which data were collected is one of five centers in the county, and is located in an urban setting. In the 2014-2015 school year, the composite score of 6.29 out of 7 was determined by the Star-Quality Child Care Program's overall quality rating that recognizes child care agencies that exceed minimum licensing standards. Quality determinants included the physical environment, health and safety procedures, materials, interpersonal relationships, and opportunities for learning and development (County Community Action Committee, 2015).

This Head Start center has 10 preschool classrooms serving 200 preschoolers between the ages of 3 and 5. Within these classrooms, there are 10 lead teachers and 12 assistants. Additionally, the center has 8 early childhood teachers and 1 assistant serving 32 toddlers and infants. A total of 38 staff members work at the center, including 31 teachers, 2 food service staff, 1 clerk, 3 family specialists, and 1 center manager.



Figure 1. Front of Head Start Center

Participants

Participants for the present study were drawn from a larger sample of 70 participants. The initial sample included both native English-speaking preschoolers as well as 13 dual-language learners. All dual-language learners spoke Spanish as their first language. Since the present study is largely language-based, these children were excluded from the data analyses. Pseudonyms for participants are used in examples presented in the next chapter.

This study was approved by the University Institutional Review Board for the Protection of Human Subjects. Participants were recruited via a consent form sent home from school to parents (see Appendix A). Teachers directly handed parents the consent forms for children who were transported home by bus. Parents who picked up their children from school received the consent forms in their child's take-home folder. This consent form described the procedures and purpose of the study, potential risks and benefits, and information being collected on the children who participated. Parents were also provided with the research team's contact information to

allow them to ask questions about participation in the study. It was clearly stated in the consent form that participation was voluntary. Two consent forms were used: an English and Spanish version depending on the parents' native language. As noted earlier, only data from children who spoke English as their primary language were included in the present study.

Participants in the present study included 57 preschoolers, who spoke English as their first language, between the ages of 3 and 5 years (M = 53.14 months; SD = 7.19 months; range = 40-70 months). Approximately half of the children were male (26 males, 31 females). Twenty children were white (35.1%), 30 African American (52.6%), 2 Hispanic/Latino (3.5%), and 5 children's ethnicities were not reported. The number of years children had spent at Head Start ranged from 1 to 4: 26 children were in Head Start for 1 year (45.6%), 21 children for 2 years (36.8%), 5 children for 3 years (8.8%), and 2 children for 4 years (3.5%). Information regarding number of years at Head Start was not obtained for 3 children. These 57 participants are the focal children who were observed in the observations described below (see Table 1 below for demographic information on the children's households and parents).

Table 1

Parental and Household Demographic Information

Number of Parents in Household				
1	2			
36 (63.2%)	19 (33.3%)			
Highest Level of Parental Education				
Some High School	High School Graduate/GED	Some College	Associate's	Bachelor's
6 (10.5%)	42 (73.7%)	4 (7%)	1 (1.8%)	1 (1.8%)
Parents' First Language				
English	Arabic	Nepali		
53 (93%)	1 (1.8%)	1 (1.8%)		
Number of Siblings in Household				
0	1	2	3 or more	
10 (17.5%)	21 (36.8%)	15 (26.3%)	9 (16.2%)	

Note. Demographic information on parents and households was missing for two participants (level of parental education missing for 3 participants).

Children were recruited from five preschool classrooms within the Head Start center (Classrooms A = 20 participants, Classroom B = 20 participants, Classroom C = 7 participants, Classroom D = 8 participants, and Classroom E = 2 participants) (See Figure 2 below).

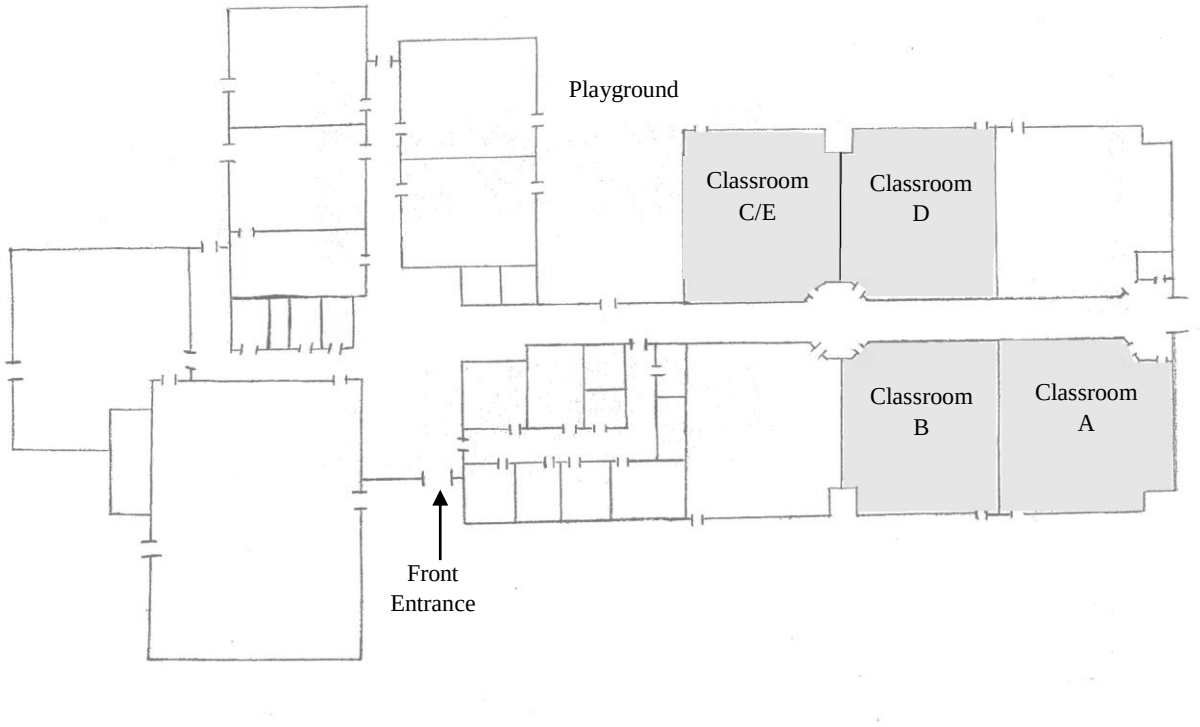


Figure 2. Diagram of Head Start Center

Classrooms A and B were full day classrooms, Classrooms C and D were part-day morning classrooms, and Classroom E was a part-day afternoon classroom (see Appendix A for photographs of each classroom). Full data were obtained on all but five participants. These five participants moved onto kindergarten before the observations were complete; however, approximately three quarters of the observations were completed on each of these participants; thus, they are included in the analyses (see Table 2 below for language compositions of classrooms).

Table 2

Number of Children per Classroom by Primary Language

Class	# of English-Speaking	# of Spanish-Speaking	# of Arabic-Speaking	Total number of Children
A	19 (95%)	0	1 (5%)	20
B	19 (95%)	0	1 (5%)	20
C	11 (58%)	7 (37%)	1 (5%)	19
D	14 (70%)	6 (30%)	0	20
E	16 (80%)	4 (20%)	0	20

Note. These demographics reflect the classroom compositions in the fall of 2015. Three primary English-speaking children in both Classrooms A and B who were included in this study moved onto kindergarten at the end of the summer, and thus are not reflected in the above classroom compositions.

Each of the five classrooms observed had one lead teacher and at least one assistant teacher (full day classrooms had one lead teacher and two assistant teachers). All lead teachers were female and ranged from 4 to 28 years of teaching experience (see Table 3 below).

Table 3

Demographics of Lead Teachers

Classroom	Gender	Highest Degree	Years Teaching/Years at Head Start	Race	Bilingual
Teacher A	Female	Bachelor's	17/8	Caucasian	No
Teacher B	Female	Associate's	28/22	African American	No
Teacher C	Female	Associate's	25/13	Caucasian	No
Teacher D	Female	Bachelor's	4/2	Caucasian	No
Teacher E	Female	Bachelor's	4/4	Caucasian	No

Procedures

Data were collected over a 7-month period (July-January). The study timeline consisted of four phases that comprised 11 months; the first three phases dealt specifically with data collection (see Table 4 below). Phase I involved establishing observational codes and interrater reliability (May). I and another graduate student observed children in preschool classrooms at a

university lab school for one month prior to collecting data. During this time, we developed each of the codes in our observational coding scheme, and the specific behavioral indicators for each code. Phase II started in June, during which we began practicing our codes in the Head Start classrooms, allowing us to become reliable, while simultaneously reducing the reactivity of our participants to our presence. Additionally, we trained one undergraduate student to conduct observations. Once all three coders were 98% reliable (percentage agreement), we began Phase III: data collection. The data collection phase lasted 7 months, during which time observations were conducted in the Head Start classrooms.

Table 4

Study Timeline

Phase I: May-June	**Phase II: June-July**	**Phase III: July-January**	**Phase IV: January-March**
• Developed behavioral indicators for codes through observations at the University lab school (ELC) • Developed codebook	• Practiced observations at ELC • Trained undergraduate research assistant to conduct observations • Trained for reliability in Head Start classrooms • Established reliability	• Data collection at Head Start • Data entry: trained 3 undergraduate students and 1 graduate student to help with data entry	• Cleaned and screened data • Analyzed data • Wrote up results

During data collection, data from four sources were obtained: focal child observations, field notes, a research journal, and global vocabulary assessments. Finally, Phase IV involved the cleaning and screening of data, data analyses, and the writing up of results of the current study.

Focal child observations. Focal child observations conducted in the Head Start classrooms were the primary data source. These observations focused on a participant child (focal child), as the researcher observed his/her behavior and interactions with peers and teachers during daily classroom activities (see Figure 3 below).



Figure 3. Observing in Classroom C

Each observation was 10 minutes long, and consisted of 15 separate intervals: 20 seconds of observation followed by 20 seconds of recording behavior. Researchers used a digital application on a tablet or phone with a pair of earphones. This application beeped to indicate when it was time to observe, when it was time to record, and when the 10-minute observation had concluded. During each record phase, the observer would either tally the number of times a behavior occurred during the previous observation interval, or rate a behavior on a scale of 0-2 (see Appendix A for coding sheet). Some codes were derived from a previous study by Neitzel & Stright (2003).

I and a second graduate student were assigned to particular classrooms to observe. For full-day classrooms (Classrooms A and B), observations were conducted between 8:45 AM-12:00 PM. For part-day morning classrooms (Classrooms C and D), observations were conducted between 8:45 AM and 11:15 AM. For the part-day afternoon classroom (Classroom E), observations were conducted between 12:00 PM and 3:30 PM. Observations were conducted 3-5 days per week throughout the 7-month data collection period.

Each child was observed for a total of 2 hours (1 hour during teacher-directed instructional activities and 1 hour during free-play). Various definitions of play have been used in the literature, but primarily focus on play being classified as open-ended activities without restriction (Bodrova & Leong, 1996; 2003; Cuffaro, 1995; Dewey, 1916). In the present study, the play context refers to less-structured, non-instructional activities. Typically, this context occurred during center time in the classrooms, during which children would choose one or more centers to play in (e.g., blocks, housekeeping, water table). Materials were provided in each center to help guide children's play; however, what materials children chose to use, and how they chose to use them was up to the individual child. Therefore, although the present study may not use as strict of a definition of play opportunities, this context still allows for fairly open-ended and self-directed activities. In contrast, the instruction context refers to more highly-structured, teacher-directed activities which required children's participation.

Typically a researcher would be actively collecting data on 4-5 children on any given day. Observations on each child spanned approximately 2-3 weeks and were collected over a minimum of 4 separate classroom visits. This was to ensure that full data would be collected on each participant in a timely manner. As a researcher completed all 12 observations on one child, she would start observing a new child. Researchers observed each child across different times in

the morning (or afternoon for Classroom E) so that the same child was not being observed at the same time each day. Additionally, researchers kept a log of how many minutes they had observed a child during instructional and play activities. This allowed for an approximately equal number of observations in each setting per child. Throughout the 7 months of observation, we also conducted interrater reliability on 15% of the observations. To do this, both myself and the other graduate student observed the same child, but coded his/her behavior separately in order to compare our findings. These joint observations were conducted approximately 1-2 days each week. The calculation of interrater reliability using Cohen's Kappa will be discussed in the following chapter.

Field notes. Two forms of field notes were taken: post-observation and on-the-spot field notes. Post-observation field notes were taken at the end of each 10-minute observation to both summarize and note anything that stood out during the observations. This included particular examples of how the child may have been using speech to engage in particular regulation behaviors (e.g., Sammy used social speech to engage in metacognitive talk about performance to the teacher: "I know how to do that.") (see Appendix A for example of post-observation field notes). In addition to taking field notes at the end of each observation, brief on-the-spot notes were also written during observations to indicate who the child was interacting with, what the child was doing, and examples of how the child was using language (see Appendix A for example of on-the-spot observation field notes). The purpose of these on-the-spot field notes was to provide examples of the behaviors of interest, as well as to situate these behaviors within a context, affording a clearer interpretation of how language and SRL may be related within the changing environment of the classroom.

Research journal. I wrote my overall impressions and questions at the end of many days of data collection in a research journal (Lincoln & Guba, 1985). I composed journal entries for approximately fifty percent of the days I spent observing. My research journal was strongly informed by my field notes. Much like the field notes, the research journal provided an opportunity to situate examples of language and SRL within the context of the classroom, including the current classroom activity and social context (e.g., who was the child interacting with, what was the nature of the interaction, what else was going on in the classroom). Additionally, I included larger impressions of the classroom, such as what events were occurring that day, especially if it disrupted the flow of everyday activities (e.g., fire drill, dentist check-ups, no outdoor play because of weather). I also noted my own expectations regarding how I hypothesized language to be related to SRL due to particular examples I had seen throughout the day (see Appendix A for an excerpt).

Global vocabulary assessments. Global vocabulary assessments generated by the Head Start teachers were included as a data source. For the purposes of this study, the assessment that is included is the Learning Accomplishment Profile Diagnostic, 3rd edition (LAP-D), used as a developmental screening for preschool-aged children.

Measures

Measures of children's proximity to social partners, SRL, and speech behaviors were acquired through classroom observations, while global vocabulary scores were obtained from Head Start. Measure names presented below also served as the labels for observational codes.

Proximity to social partners. During focal child observations, *the child's proximity to social partners* was recorded. Proximity was defined as the focal child sharing a space with another child and/or teacher (e.g., child and a peer are both in the block center). Proximity did

not require the child to be interacting with his/her social partner(s). The child was coded as being solitary (no proximal peers), in a dyad (1 proximal peer), small group (2-4 peers), or large group (5 or more peers). Additionally, the child was coded for proximity to the teacher (child was coded as either proximal or not proximal to a teacher). Proximity to social partners was coded during each 20-second observation interval in order to assess the changing social contexts that the focal child experienced.

Self-regulated learning. Two types of self-regulated learning behaviors were coded: *independent regulation* and *social regulation*. Independent regulation is exemplified by the child engaging in SRL on his/her own, such as the child checking his/her own work, monitoring his/her progress, and making predictions and evaluations about one's own performance. For example, a child may say, "I'm going to build the roof and then the door." This illustrates the child developing a personal strategy to obtain a goal (building a house out of blocks) and accomplishing it without help from others. Social regulation involves the child seeking an external source when regulating. This includes seeking help from others in the form of physical assistance or information, as well as engaging in social monitoring where the child may compare their work to that of peers. For example, a child making a snowman out of clay may frequently look at her peer's snowman in order to copy her strategy. Additionally, the child could ask her peer for help in making the snowman, or make a social comparison regarding the snowmen (e.g., "Your snowman is good and mine's bad."). All regulation behaviors were coded through frequency counts during each 20-second observation interval. Independent regulation and social regulation composites were created from a number of observed behaviors.

Independent regulation. Independent regulation included the focal child's a) use of metacognitive talk about performance, b) metacognitive talk about strategies, and c) self-monitoring.

a) *Metacognitive talk about performance* was identified as instances when the focal child discussed personal strengths or limitations, what he/she was thinking or how he/she reacted during a task, or factors that influenced his/her performance (positively or negatively) or posed particular challenges. Examples include the child stating, "I messed up," "I'm finished," and "I did a good job."

b) *Metacognitive talk about strategies* was identified as instances where the child talked evaluatively about strategies for how an answer or solution was reached, why he/she approached a problem a certain way, the effectiveness of a strategy or alternative strategies, task requirements, or how tasks "work" (e.g., "It worked when I took the door off it."; "I'm putting the big blocks on the bottom."; "I'm picking the blue ones first, and then the red ones."). Both types of metacognitive talk involved the child discussing his/her own thinking process.

c) *Self-monitor* was identified as instances where the child independently checked his/her own work, set goals, developed strategies to meet those goals, or evaluated and reflected on one's own work. This often involved the child engaging in private speech while working on an independent task (e.g., "I'm cutting out all the pictures of sweets.").

A composite score was created for each observation interval by summing the different independent regulation behaviors. Co-occurrences were coded once as to avoid overinflating the independent regulation composite. That is, if a particular behavior was dual-coded as both

metacognitive talk about performance and self-monitoring, the total score assigned for that observation interval was one.

Social regulation. Social regulation included the focal child's a) use of language to express instrumental needs, b) requests for information, c) planning with others, and d) social monitoring.

a) The *child's expression of instrumental needs* included the *child's wanting something* from a teacher or peer, typically a tangible object (e.g., "I want the yellow crayon."), but he/she could also want to do something (e.g., "I want to play in the block center."). Instrumental needs also included the focal child's engagement in *help-seeking,* during which he/she asked a social partner for help. This is distinct from want/need, because the child specifically requested another's assistance (e.g., "Can you help me tie my shoe?"; "Can you pass me the bowl?"). A composite score for instrumental behavior was created by summing a child's expression of want/need and help-seeking behavior in each observation interval.
b) The *child's requests for information* included *questions soliciting objective, factual information,* or requests for more details about a topic (e.g., "What does a dinosaur eat?"; "How come it's raining?"). A second type of request for information included the focal *child seeking task or process information*. This may consist of strategies, rationales, and explanations of why things work (e.g., "How do I draw a flower?"). A composite of children's requests for information was created by summing both types of behavior in each observation interval.
c) The focal *child's planning with a social partner* involved the child talking about the future as opposed to simply informing others what they were doing in the present

(e.g., "Let's build the door first, then the window."). Planning required the focal child to be the active agent who made the plans rather than simply following his/her peer's instructions.

d) *Social monitoring* involved the child engaging in social comparison to monitor his/her own work or comparing his/her work to that of peers (e.g., "I made mine bigger than hers."). Social monitoring could also be nonverbal (e.g., focal child is building blocks and looks to other child playing with blocks and copies strategies).

A composite score was created for each observation interval by summing the four social regulation behaviors (instrumental, requests for information, planning, and social monitoring).

Use of speech. During observations, the focal child's use of private and social speech was coded. *Private speech* was coded as any verbalizations the child makes to oneself. This includes both discernable speech and mumbling. *Social speech* was coded as any verbalizations the child makes to another person. For each 20-second observation interval, children were assigned a rating from 0 to 2 identifying how often they engaged in that type of speech (0 = never, 1 = sometimes, 2 = often). Ratings of children's use of private speech and social speech were averaged across intervals for individual children to obtain an overall aggregate score for each speech type.

Global Vocabulary. Children's global vocabulary abilities were obtained from Head Start using the Learning Accomplishment Profile Diagnostic, 3rd edition (LAP-D). The LAP-D is a comprehensive developmental screening for children between the ages of 30 and 72 months that assesses four main areas of development: gross motor, fine motor, cognitive, and language. Additionally, the LAP-D provides comparison scores for developmental norms according to the child's age. The lead teacher in each classroom conducts the LAP-D screening on each child

three times throughout the school year (beginning, middle, and end of year). In total, the LAP-D takes an hour to an hour and a half to administer. Children's scores closest to the time of observation were used. For the purposes of the present study, only the language measures are reported. The LAP-D assesses two areas of language development: language naming (expressive vocabulary) and language comprehension (receptive vocabulary). The language naming assessment involved the teacher showing the child different pictures of objects, body parts, actions, animals, etc., and asking the child to name it. The language comprehension assessment involved the teacher showing the child series of pictures and asking them to identify objects, actions, colors, etc. upon request (e.g. "Point to the picture of dog."). In addition to language naming and language comprehension subtest scores, a composite score of children's total language was also obtained. This composite score of children's expressive and receptive vocabulary will be used as children's global vocabulary score in the present study.

Role of the Researcher

I spent seven months immersed in five Head Start classrooms (as much as four months in individual classrooms), and as a result, I acknowledge that I cannot assure that I remained completely objective as a researcher. After spending an extended period of time in the classroom, a high level of comfort developed between myself and the teachers, children, and overall classroom environment. Because of this, I became part of the classroom community in a unique way. Therefore, I view myself as assuming the role of a participant observer in the classroom, and with this comes the challenge of addressing my subjectivity (Labaree, 2002). Peshkin (1988) argued that subjectivity can never be completely removed, and so a researcher should be mindful of his/her own subjectivity. While the rigidity of my coding manual helped

me to maintain some objectivity during observations, it is necessary to recognize the role that my subjectivity played, and what helped me continually check in and control it.

Some issues linked to my subjectivity were preferences for observing in one classroom over another, or observing one child over another. Some children completely ignored my presence in the classroom, making it much easier to observe them. Others either really enjoyed my presence or were hyper-aware when they were being observed. Both types of children posed their own challenges when observing them. Also, I would experience some frustration when not being able to intervene in some children's conflicts at times when the teachers were preoccupied in other areas of the classroom. I also found it difficult to ignore or deny children's attempts at interacting with me during observations. To combat this, I allotted time either before, in-between, and/or after observations during which I interacted with both children and teachers. I felt these interactions were important in fostering and maintaining the level of comfort and trust between myself and the teachers and children. One way of handling my subjectivity was keeping a research journal through which I was able to reflect on my experiences, and pose questions or challenges I had encountered. For example, I noted changes in children's overall behavior on days in which the typical classroom schedule was altered, such as not having outdoor play due to weather. Additionally, I would have daily discussions with my collaborator, the other graduate student researcher, about our experiences in the field. This included sharing our impressions, feelings, frustrations, resolutions, and emerging understandings. Through these informal reflections, I was able to gain insight into my subjectivity and understand how it may have influenced me as a participant observer and ways to keep it in check.

Analysis

First, a repeated measures MANOVA and a paired samples t-test was conducted examining the role of social partner (peers and teacher) on children's use of speech and SRL. This provides information on how the social environment affects children's engagement in different linguistic strategies. The primary analysis consisted of a series of path analyses analyzing the observational data and global assessments due to the hypothesized mediation of global vocabulary abilities effect on SRL strategies by children's use of classroom speech (private vs. social) (see Figure 4 below for path diagram of full model).

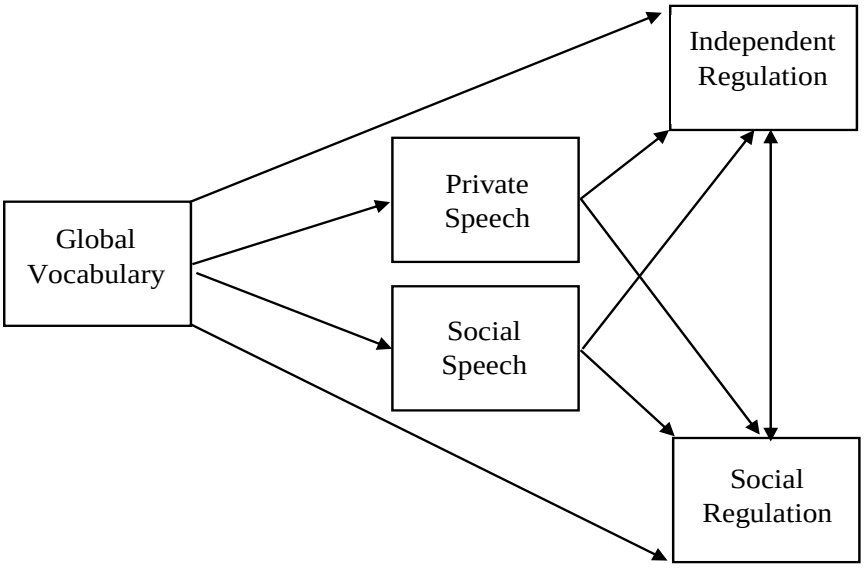


Figure 4. Path diagram of full model

All variables in the model are observed variables with a single indicator. By using path analysis, I am afforded the opportunity to test both direct and indirect effects within the model. Because path analysis simultaneously controls for all effects between variables in the model, it provides a more accurate measure of variable relationships than alternative analyses (Duncan,

1975). Specifically, the full model identified global vocabulary (composite of receptive and expressive) as the independent variable. The model specified direct effects between vocabulary and SRL strategies (independent and social), as well indirect effects of vocabulary on SRL through the use of speech (private speech and social/communicative speech). Additionally, three separate models were tested: one for each context (play and instruction) and a third one, collapsed across both contexts.

Secondarily, a qualitative analysis was conducted using observational field notes and my research journal. Specifically, a content analysis was performed, seeking to identify patterns or trends in the data. Content analysis is used to decipher meaning from qualitative data, thus interpreting the social reality of the text (Bos & Tarnai, 1999; Graneheim & Lundman, 2004). Numerous content analysis techniques have been utilized in past research, and vary on their employment of inductive versus deductive methods, focus on manifest or latent content, and decisions on unit of analyses (Bos & Tarnai, 1999; Elo & Kyngas, 2008; Graneheim & Lundman, 2004; Hsief & Shannon, 2005; Lincoln & Guba, 1985). In the current study, I relied on Graneheim and Lundman's description of content analysis, following three primary steps: data reduction, distillation (or condensation), and abstraction. Reduction involves decreasing the size of the text through identifying meaning units, distillation entails condensing these meaning units into categories, and abstraction requires organizing these categories into larger themes. In particular, I focused on manifest content, or the visual components of the text as opposed to the underlying meaning (latent content). Additionally, I took a deductive approach, using pre-existing theory and literature to guide my category selection.

Chapter Summary

In summary, in the present study I conducted focal child observations to examine the relationship between speech and SRL behaviors in the preschool classroom in both play and instruction contexts. Additionally, global vocabulary scores were obtained from Head Start to determine the impact of global vocabulary on children's speech and SRL behaviors. Field notes and a research journal were kept throughout the observations as supplemental sources of data. The next chapter will discuss the results from both quantitative and qualitative analyses.

Chapter 4: Results

Interrater Reliability

Cohen's kappa was computed for each variable to assess interrater reliability using SPSS (Version 23) (see Table 5 in Appendix B). Cohen's kappa calculates the proportion of agreement between observers above and beyond chance agreement. According to the benchmarks established by Landis and Koch (1977), kappa values between .81-1.00 indicate almost perfect agreement, kappa values between .61-.80 indicate substantial levels of agreement, and kappa values between .41-.60 indicate moderate levels of agreement. Interrater reliability coefficients yielded either substantial or almost perfect levels of agreement for all but two variables: help-seek and metacognitive talk about performance which yielded moderate levels of agreement. It is important to note that due to the short time intervals, target behaviors occurred relatively infrequently (with the exception of speech). In particular, metacognitive talk about performance only occurred during 2% of observation intervals and help-seek only occurred during 0.4% of observation intervals. It has been previously argued that in cases where the prevalence of behaviors is at extremes (either very high or very low prevalence), Cohen's kappa may not provide an accurate estimate of interrater reliability (Kuppens, Holden, Barker, & Rosenberg, 2011). These instances, labeled "kappa paradoxes", can lead to "an unreasonably low [kappa] value despite a high percentage of agreement" (Kuppens et al., 2011, p. 188).

As a result, percentage agreement was then calculated for the two codes with relatively low kappa values. The percentage agreement for metacognitive talk about performance was 97.4% and the percentage agreement for help-seek was 99.6%. Therefore, the low kappa values are likely due to low prevalence of behavior rather than a problem with reliability of codes. Although kappa is arguably a much more accurate determinant of interrater reliability than

percentage agreement, it is important to acknowledge its limitations when dealing with observational data of this nature, in which particular behaviors are low in their prevalence.

Global vocabulary scores

The LAP-D scores revealed great variability in both children's expressive and receptive vocabulary. The LAP-D provides both raw scores and percentile rankings. Children's language naming raw scores (expressive vocabulary) ranged from 9 to 29 (M = 18.07, SD = 6.18). Children's percentile scores for the language naming measure ranged from 3% to 99% (M = 60.60%, SD = 28.02%). Children's language comprehension raw scores (receptive vocabulary) ranged from 5 to 23 (M = 17.19, SD = 4.66), while their percentile scores ranged from 2% to 97% (M = 49.57%, SD = 29.44%). Children's language naming and language comprehension scores were very highly correlated (r = .77, p < .001), providing support for creating a composite global vocabulary score by averaging the two scores for each child.

Treatment of Missing Data

Analyses for the present study were based on observational data and global vocabulary scores of the 57 participating children. Out of these participants, there were missing data on five children. These five children were all observed between 80 and 100 minutes, rather than the full 120 minutes. These data are considered MAR (missing at random) due to these children moving on to kindergarten before data collection was complete. As a result, they were included in the present study. Because observational behaviors were aggregated across the different observations, no additional treatment of missing data was needed.

Role of Social Context

Because of the hypothesized importance of children's use of speech in their engagement in SRL, a series of analyses were conducted to examine the role of proximity to social partners to

determine what social contexts better support children's enactment of speech and regulation strategies. Means and standard deviations for speech and regulation behaviors by proximity to social partners can be found in Table 6 (see Appendix B).

Speech and SRL by proximity to peers. A repeated measures MANOVA was conducted with proximity of peers as the repeated measures independent variable (solitary, dyad, small group, large group), and private speech, social speech, independent regulation, and social regulation as the dependent variables. The test of multivariate effects yielded significant results (Wilk's $\lambda = .15$, $F(12, 45) = 21.52$, $p < .001$, $\eta_p^2 = .85$). Wilk's λ indicates the proportion of variance of the combination of dependent variables not accounted for by the independent variable (Crichton, 2000); thus, approximately 85% of the variance in children's use of private speech, social speech, independent regulation, and social regulation is accounted for by their proximity to peers. Mauchly's test of sphericity yielded significant results for all four dependent variables, indicating that the variances between levels of the independent variable are not equal (private speech: Mauchly's $W(5) = .22$, $p < .001$; social speech: Mauchly's $W(5) = .71$, $p = .002$; independent regulation: Mauchly's $W(5) = .76$, $p = .009$; social regulation: Mauchly's $W(5) = .76$, $p = .011$). As a result, the Huynh-Feldt correction will be reported for univariate tests to control for this violation of sphericity. The Huynh-Feldt correction is appropriate when the epsilon measures are high (Huynh & Feldt, 1976) (see Figure 5 in Appendix B for graph of speech and SRL behaviors by proximity to peers).

The univariate test revealed a significant effect of proximity to peers on children's use of private speech ($F(1.57, 87.92) = 37.10$, $p < .001$, $\eta_p^2 = .40$). Post-hoc comparisons were conducted using the Bonferroni adjustment, and revealed significant differences in children's use of private speech among all levels of peer proximity. Children engaged in significantly higher

amounts of private speech when they were solitary as compared to when they were in a dyad (p = .007, SE = .05), small group (p < .001, SE = .05), or large group (p < .001, SE = .05). Children also engaged in private speech significantly more often when they were in a dyad than in a small group (p = .002, SE = .02) or large group (p < .001, SE = .02). Finally, children engaged in private speech significantly more often when in a small group compared to a large group (p < .001, SE = .02). These findings illustrate that children's proximity of peers has a negative effect on engagement in private speech: as the number of peers in close proximity to the child increases, use of private speech subsequently decreases.

The univariate test also revealed a significant effect of proximity to peers on children's use of social speech using the Huynh-Feldt correction (F(2.70, 151.20) = 37.98, p < .001, η_p^2 = .40). Post-hoc comparisons were conducted using the Bonferroni adjustment. These post-hoc tests revealed that children engaged in significantly higher amounts of social speech when in a dyad and small group than in a large group or when solitary (all comparisons significant at p < .01). There was no difference between children's use of social speech when in a dyad versus a small group (p = 1.00, SE = .04). Additionally, children engaged in social speech significantly more often when in large groups as compared to when solitary (p < .001, SE = .05). These findings illustrate that there is a curvilinear relationship between proximity to peers and use of social speech, in which social speech peaks when in a dyad or small group, but declines when in a large group or solitary.

In addition to use of speech, children's engagement in SRL also differed by proximity to peers. The univariate test revealed a significant effect of proximity to peers on independent regulation using the Huynh-Feldt correction (F(2.74, 152.04) = 13.64, p < .001, η_p^2 = .20). Post-hoc comparisons were conducted using the Bonferroni adjustment. Post-hoc tests revealed that

children's engagement in independent regulation did not differ between when they were solitary, in a dyad, and in a small group; however, children's use of independent regulation was significantly higher in these three social contexts as compared to when children were in a large group ($p < .001$ for all three comparisons). From these results, it appears that peers only have a negative impact on children's independent regulation when there are too many (large group equals 5 or more peers).

Much like independent regulation, proximity to peers also yielded a significant effect on social regulation through the univariate test using the Huynh-Feldt correction ($F(2.64, 147.89) = 25.36$, $p < .001$, $\eta_p^2 = .31$). Post-hoc comparisons were conducted using the Bonferroni adjustment. Post-hoc tests illustrated that children engaged in social regulation when in a dyad significantly more often than when solitary ($p = .005$, $SE = .02$) or in a large group ($p < .001$, $SE = .01$). There was no significant difference in social regulation when children were in a dyad or a small group. Additionally, children engaged in social regulation more often when in a small group or when solitary as compared to when in a large group of peers ($p < .001$, $SE = .01$; $p = .001$, $SE = .01$, respectively). Small group and solitary proximity levels did not differ in amount of social regulation ($p = .10$, $SE = .02$). This is a similar pattern to the role of peer proximity on social speech where proximity to a small number of peers (dyad or small group) yields the highest engagement in the particular behavior; however, social regulation is lowest when children are in a large group as opposed to children being solitary yielding the lowest levels of social speech.

Speech and SRL by proximity to teacher. In addition to children's proximity to peers, children's proximity to teachers was also hypothesized to affect their speech and regulation behaviors. To test this hypothesis, a two-tailed paired samples *t*-test was conducted with

proximity to teacher (teacher not proximal, teacher proximal) as the independent variable and children's use of private speech, social speech, independent regulation, and social regulation as the dependent variables (means and standard deviations for speech and regulation behaviors by proximity to teacher can be found in Table 6 in Appendix B). Effect size was calculated through Morris & Deshon's (2002) Cohen's *d* equation for dependent samples t-tests using mean difference scores as the numerator and a function of the standard deviation of difference scores as the denominator. The test yielded a significant effect of proximity to teacher on private speech ($t(56) = 11.53$, $p < .001$, Cohen's $d = 1.93$) but not social speech ($t(56) = -1.279$, $p = .210$, Cohen's $d = .17$). While a teacher's presence decreases children's use of private speech, there is no difference in children's use of social speech when the teacher is proximal versus not proximal. Additionally, teacher proximity had a significant effect on children's engagement in independent regulation ($t(56) = 3.35$, $p = .001$, Cohen's $d = .48$) but not engagement in social regulation ($t(56) = -.49$, $p = .626$, Cohen's $d = .07$). Much like the relationship between teacher proximity and private speech, a teacher's presence seems to negatively impact children's engagement in independent regulation (see Figure 6 in Appendix B for graph of differences in speech and SRL by proximity to teacher).

Role of Classroom Context

Classroom context was hypothesized to affect children's engagement in speech and SRL behaviors. To test this hypothesis, a two-tailed paired-samples t-test was conducted with classroom context as the independent variable (instruction vs. play) and children's private speech, social speech, independent regulation, and social regulation as the dependent variables. All speech and SRL behaviors differed significantly by classroom context. In the play context compared to the instruction context, children engaged significantly higher levels of private

speech ($t(56) = 9.43$, $p < .001$, Cohen's $d = 1.40$), social speech ($t(56) = 2.89$, $p = .005$, Cohen's $d = .39$), independent regulation ($t(56) = 3.23$, $p = .002$, Cohen's $d = .44$), and social regulation ($t(56) = 3.95$, $p < .001$, Cohen's $d = .53$). Not only do play activities seem to foster higher levels of speech, but they also appear to provide more opportunities for children to regulate their learning as well (see Figure 7 for graph of differences in speech and SRL by context in Appendix B).

Path Analysis

Path analysis was conducted using MPlus 7.0. Structural models were estimated using the Bootstrap approach in which 10,000 samples were drawn from the data with replacement. The structural model was then run on each of the samples, and a distribution was created from the estimates of the samples. The Bootstrap approach allows for the estimation of both direct and indirect pathways between observed variables. Standardized estimates will be used to interpret the findings from the path analyses.

Assessing model fit. Four fit indices will be used to assess model fit: the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), the comparative fit index (CFI), and the Tucker-Lewis index (TLI). Both the RMSEA and SRMR are measures of absolute fit, with values approaching 0 indicating good model fit (Brown, 2006). One key difference between the two is that the RMSEA is a population-based index, and thus is sensitive to the number of model parameters included (Brown, 2006). Furthermore, Brown warns that confidence intervals associated with the RMSEA tend to be very wide unless the sample size is quite large. The CFI and TLI are measures of incremental or comparative fit with values approaching 1.00 indicating good model fit. The TLI is a non-normed estimate, with values potentially exceeding 1.00. Hu and Bentler (1999) argue that both the TLI and RMSEA

are sensitive to sample size, and may falsely reject models with a small N. Model fit was assessed using the following standards: RMSEA < .08, SRMR < .08, CFI > .90, TLI > .90 (Brown, 2006). If 3 out of 4 index standards were met, the model fit was considered acceptable.

Model 1: Collapsed across contexts. The first structural model tested was the overall model collapsed across contexts. Two covariates were first added to the model to control for their possible effects on the dependent variables: gender and age in months. Gender was dummy coded in SPSS (Male = 0, Female = 1) before importing the data into Mplus. Semi-partial covariate effects were tested, in which covariate effects are removed from all dependent variables (see Figure 8 in Appendix B). This is accomplished in Mplus by regressing each dependent variable (private speech, social speech, independent regulation, and social regulation) on each covariate. The only significant covariate effect was gender on independent regulation (β = -.300, *SE* = .129, p = .020, 95% CI = -057, -.003). Nonsignificant covariate effects were dropped from subsequent analysis.

After testing for covariate effects, a path analysis was conducted on the saturated model in which all direct and indirect pathways were specified, in addition to the covariate of gender on independent regulation (see Figure 9 for full model, Figure 10 for indirect effects, and Table 7 for R^2 values in Appendix B). The saturated model yielded acceptable model fit: $\chi^2(4) = 2.664$; RMSEA = .000, confidence intervals [.000, .166]; CFI = 1.000; TLI = 1.1.05; SRMR = .042. While the CFI, TLI, and SRMR all yield good model fit, the upper confidence interval of the RMSEA exceeds .08. This suggests possible misfit; however, since 3 of the 4 indices imply good model fit, and the RMSEA confidence intervals is sensitive to sample size (Hu & Bentler, 1999), the model fit is considered acceptable.

There were a number of nonsignificant pathways in which the standardized beta values were extremely low. To reach a final model, I pruned nonsignificant pathways one at a time, and conducted nested chi-square comparisons to the saturated model. This allowed me to test if a more parsimonious model could be used, or if it resulted in worse model fit. In particular, I pruned the three nonsignificant indirect paths: global vocabulary on independent regulation through private speech (*ab* = .012, *p* = .765, 95% CI = .000, .001), global vocabulary on independent regulation through social speech (*ab* = .021, *p* = .660, 95% CI = .000, .001), and global vocabulary on social regulation through private speech (*ab* = -.012, *p* = .664, 95% CI = .000, .000) (standardized indirect effects are presented). Additionally, I pruned all pathways involving independent regulation, with the exception of gender on independent regulation and the pathway correlating social regulation with independent regulation. Finally, I pruned the pathway between private speech and social regulation (see Figure 11 below for a path diagram of the final model and Table 7 in Appendix B for R^2 values).

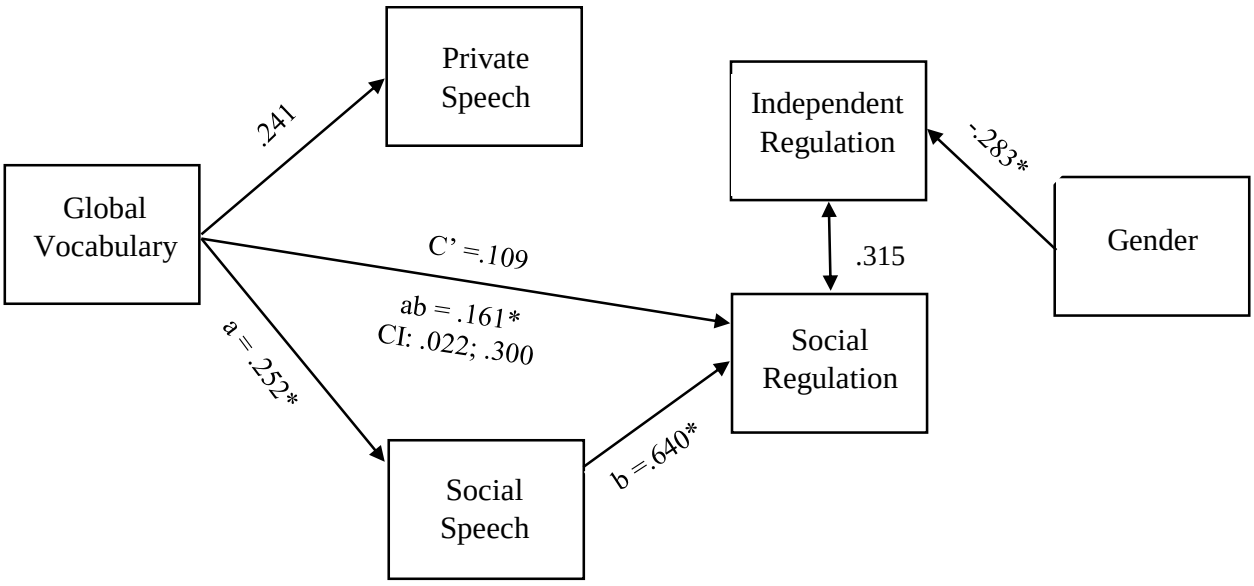


Figure 11. Pruned Model 1 (collapsed across context). Standardized estimates are presented.

After reaching the final pruned model, I conducted a nested chi-square comparison test with the initial saturated model, and received a nonsignificant chi square value ($\chi^2(2) = .413$, $p = .813$). This indicates that no model fit was lost by pruning the nonsignificant paths. The final pruned model yielded acceptable model fit: $\chi^2(6) = 3.077$; RMSEA = .000, confidence intervals [.000, .110]; CFI = 1.000; TLI = 1.153; SRMR = .048. Much like the saturated model, the fit indices all reveal acceptable fit with the exception of the RMSEA confidence intervals.

Standardized estimates are presented below, along with unstandardized estimates and their associated standard errors and significance values, and 95% confidence intervals provided by the bootstrap approach. The final pruned model revealed a significant positive effect of global vocabulary on social speech ($\beta = .252$; $B = .005$, $SE = .002$, $p = .028$, 95% CI = .001, .010). While the model revealed a significant effect of global vocabulary on private speech, the confidence intervals contain zero ($\beta = .241$; $B = .002$, $SE = .001$, $p = .034$, 95% CI = .000, .005); thus this effect is not significant. Therefore, children with higher global vocabulary scores appear to engage in social speech more frequently than children with lower global vocabulary scores, but there is no difference in their use of private speech. Additionally, social speech positively predicted children's engagement in social regulation ($\beta = .640$; $B = .144$, $SE = .021$, $p < .001$, 95% CI = .102, .183). Gender was a significant covariate predicting independent regulation ($\beta = -.283$; $B = -.026$, $SE = .012$, $p = .029$, 95% CI = -.052, -.004), in which girls engaged in lower levels of independent regulation than boys. Finally, there was a significant indirect relationship between global vocabulary and social regulation through social speech (standardized $ab = .161$, $SE = .071$, $p = .023$, 95% CI = .022, .300). Therefore, children with higher global vocabulary scores appear to engage in social speech more often, which results in more frequent social regulation.

Model 2: Play context. The next structural model assessed relationships between variables in the play context, in which activities were student-centered and had less overall structure imposed by the teacher. Gender and age in months were first included as covariates to test semi-partial covariate effects on each of the dependent variables (private speech, social speech, independent regulation, and social regulation). Like Model 1, the only significant covariate effect was gender on independent regulation (β = -.274, *SE* = .129, *p* = .034, 95% CI = -.083, .002); because zero falls within the bootstrapped confidence intervals, the effect of gender on independent regulation may not be significant. Due to the moderate standardized slope, gender was still included in further models as a covariate of independent regulation. Nonsignificant covariate effects were dropped from subsequent analyses.

After testing for covariate effects, I conducted a path analysis on the saturated model, specifying all possible direct and indirect pathways, in addition to the covariate effect of gender on independent regulation (see Figure 12 for full model, Figure 13 for indirect effects, and Table 7 for R^2 values in Appendix B). The saturated model yielded good model fit ($\chi^2(4) = 4.248$; RMSEA = .033, confidence intervals [.000, .205]; CFI = .995; TLI = .981; SRMR = .057). Once again, all fit statistics reveal acceptable fit with the exception of the RMSEA confidence intervals.

There were a number of nonsignificant pathways with very low beta values. To reach a final model, I pruned nonsignificant pathways one at a time, conducting nested chi-square comparisons to the saturated model. I first pruned the three nonsignificant indirect effects: global vocabulary on independent regulation through private speech (*ab* = .018, *p* = .564, 95% CI = .000, .001), global vocabulary on independent regulation through social speech (*ab* = -.026, *p* = .506, 95% CI = -.001, .000), and global vocabulary on social regulation through private

speech (*ab* = -.037, *p* = .306, 95% CI = -.001, .000) (standardized indirect effects are presented). Additionally, I pruned all pathways involving independent regulation with the exception of the covariate effect of gender on independent regulation and the pathway correlating independent regulation with social regulation.

After reaching the final pruned model, I conducted a nested chi-square comparison test with the initial saturated model, and received a nonsignificant chi-square value ($\chi^2(3) = 1.910$, $p = .591$). This indicates that no model fit was lost by pruning the nonsignificant pathways. The final pruned model yielded acceptable model fit ($\chi^2(7) = 6.158$; RMSEA = .000, confidence intervals [.000, .151]; CFI = 1.000; TLI = 1.036; SRMR = .071). All fit indices reveal acceptable fit except for the RMSEA confidence intervals (see Figure 14 below for diagram of pruned Model 2, and see Table 7 for R^2 values in Appendix B).

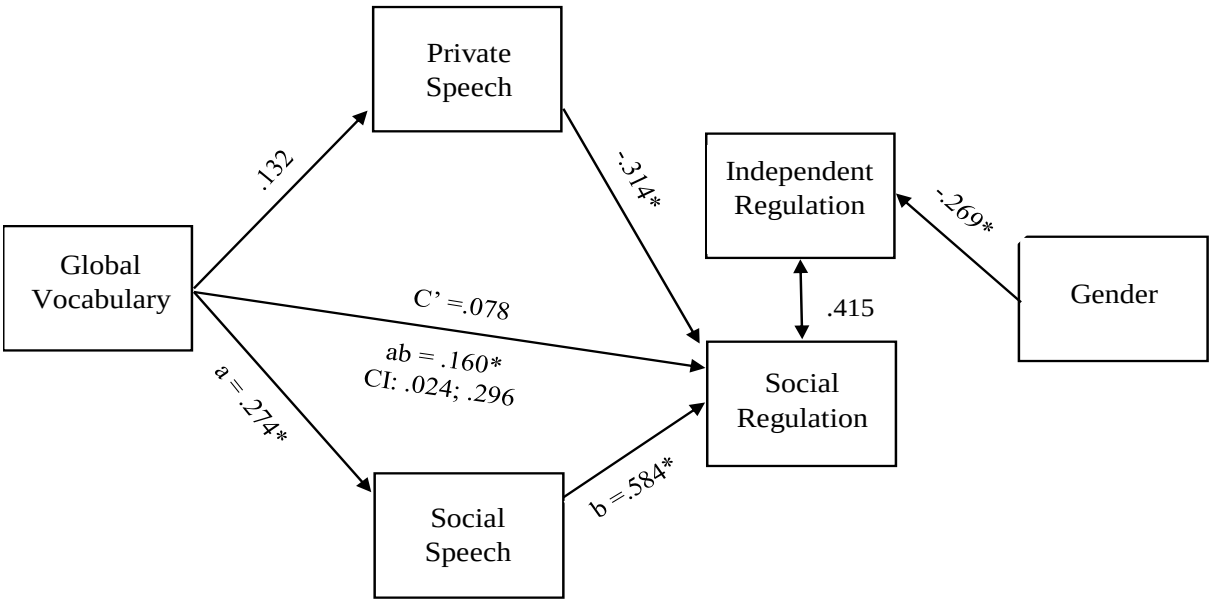


Figure 14. Pruned Model 2 (play context). Standardized estimates presented.

Standardized estimates are discussed below, in addition to unstandardized estimates and their associated standard errors and significance values, and bootstrapped confidence intervals. The final pruned model revealed a significant positive effect of global vocabulary on children's use of social speech (β = .274; B = .008, SE = .003, p = .011, 95% CI = .002, .013), but a nonsignificant effect of global vocabulary on children's use of private speech (β = .132; B = .002, SE = .002; p = .233, 95% CI = -.001, .006). Additionally, children's use of private speech negatively predicted their engagement in social regulation (β = -.314; B = -.125, SE = .035, p < .001, 95% CI = -.202, -.064), whereas their use of social speech positively predicted their engagement in social regulation (β = .584; B = .146, SE = .021, p < .001, 95% CI = .106, .190). Therefore, in the play context, social speech appears to increase children's engagement in social regulation whereas private speech may actually hinder it. Gender as a covariate had a significant effect on independent regulation (β = -.269; B = -.036, SE = .016, p = .025, 95% CI = -.070, -.007), illustrating that girls engaged in lower levels of independent regulation in the play context than boys. Finally, there was a significant indirect relationship between global vocabulary and social regulation through the use of social speech (standardized estimate: ab = .160, SE = .069, p = .021, 95% CI = .024, .296). This finding illustrates that global vocabulary predicts children's frequency of social regulation by means of their use of social speech in the play context.

Model 3: Instruction context. The final structural model assessed the relationship between variables in the instruction context, in which activities were teacher-directed and had more overall structure imposed by the teacher as compared to the play context. Gender and age in months were first included as potential covariates to test for semi-partial covariate effects on each of the dependent variables. No significant covariate effects were found, and thus gender and age in months were dropped from further analyses.

Next, a path analysis was conducted on the saturated model in which all direct and indirect pathways were tested (see Figure 15 for full model, Figure 16 for indirect effects, and Table 7 for R^2 values in Appendix B). The fit indices for the full model are as follows: $\chi^2(1) = 2.898$; RMSEA = .182, confidence intervals [.000, .443]; CFI = .954; TLI = .540; SRMR = .055. Both the RMSEA and TLI values reveal noticeably poor fit. The TLI is known to penalize models additional freely estimated paths that do not improve model fit (Brown, 2006). Upon further examination, no indirect effects were significant in this model, and inclusion of these paths was likely the cause of the low TLI value.

As a result, I reran the model specifying direct paths only. This revised model yielded much better fit than the previous model which examined both direct and indirect effects: $\chi^2(3) = 3.825$, RMSEA = .069, confidence intervals [.000, .244]; CFI = .980; TLI = .933; SRMR = .069. There were a number of nonsignificant paths. To reach a final model, I pruned nonsignificant pathways one at a time and conducted nested chi-square comparisons to the original model. In particular, I pruned paths between global vocabulary and social regulation, global vocabulary and social speech, and private speech and independent regulation. After reaching the final model, I received a nonsignificant chi-square difference score ($\chi^2(2) = .927$, $p = .629$), indicating no model fit was lost. The final pruned model yielded acceptable model fit ($\chi^2(3) = 3.825$; RMSEA = .069, confidence intervals [.000, .244]; CFI = .980; TLI = .940; SRMR = .069).

Standardized estimated are presented below, along with unstandardized estimates and their associated standard errors and significance values, and bootstrapped confidence intervals. Global vocabulary positively predicted children's use of private speech ($\beta = .307$; $B = .002$, $SE = .001$, $p = .015$, 95% CI = .001, .004). That is, children with higher global vocabulary scores used private speech more often in the instruction context than children with lower global vocabulary

scores. Children's use of social speech positively predicted both independent regulation (β = .317; B = .062, SE = .024, p = .012, 95% CI = .014, .128) and social regulation (β = .491; B = .114, SE = .027, p < .001, 95% CI = .062, .176). Thus, children who utilized high levels of social speech engaged in both types of regulation more frequently than those who used lower amounts of social speech. There was also a marginal positive relationship between private speech and social regulation (β = .203; B = .158, SE = .082, p = .055, 95% CI = -.035, .339). Since zero falls within the 95% confidence intervals, this effect should be interpreted with caution (see Figure 17 below for path diagram of pruned Model 3, and Table 7 for R^2 values in Appendix B).

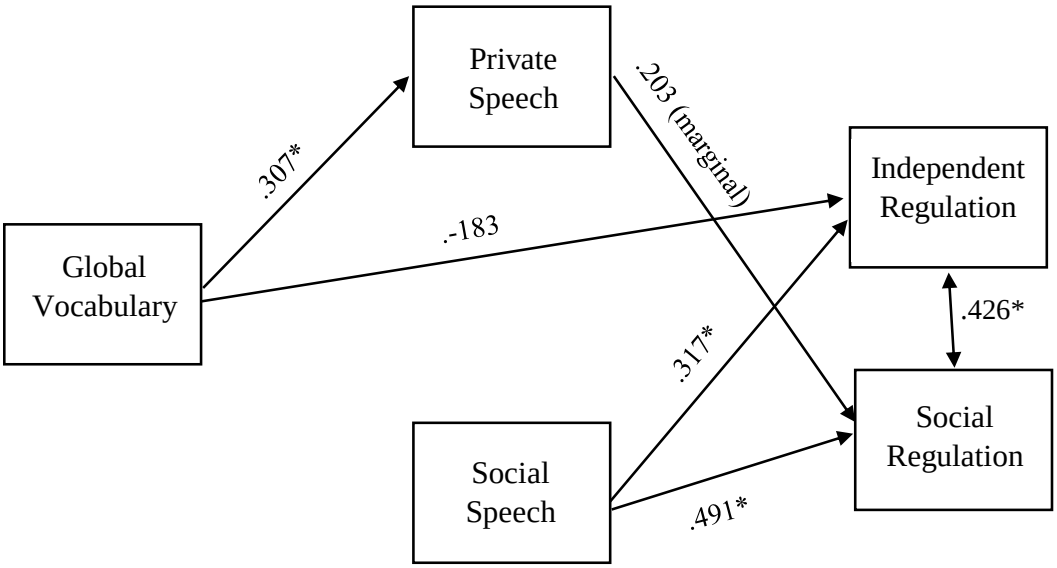


Figure 17. Pruned Model 3 (instruction context). Standardized estimates presented.

Summary of Quantitative Analyses

Repeated measures MANOVA and a series of paired samples *t*-tests revealed that children's engagement in speech and SRL behaviors differed by both proximity to social partner and classroom context. Private speech and independent regulation were negatively associated

with proximity to social partners, while social speech and social regulation peaked when children were proximal to a small number of peers. Additionally, all speech and SRL behaviors occurred more frequently in the play context (less-structured, child-centered activities) than the instruction context (more structured, teacher-directed activities). A series of path analyses found that the relationship between global vocabulary, speech, and SRL differed between play and instructional contexts. Major differences by context included the relationship between global vocabulary and use of private versus social speech, the effect of private speech on social regulation, and the effect of social speech on independent regulation. Next, results of a qualitative analysis will be presented to help contextualize these findings.

Qualitative Content Analysis

A qualitative content analysis was conducted on my research journal entries and field notes of reflections and impressions of my time spent observing in the classrooms, thereby situating the results of the quantitative analyses into the classroom context. Following Graneheim and Lundman's (2004) protocol, data were first reduced into meaning units, which consisted of independent actions of the focal child or series of actions between the focal child and a social partner. These meaning units, or episodes, were then classified into numerous categories. Finally, themes were drawn from the relationships derived between the different categories. Three overall themes were identified: purposes of social speech, teachers modeling verbal strategies to children, and purposes of private speech.

Theme 1: Purposes of social speech. The first overarching theme that emerged from the data was children's different uses of social speech, or speech used to communicate with others. Children were found to use social speech in some ways that were included in the observational coding scheme such as planning with others, help-seeking, and expressing want/need; however,

there were a number of other uses of social speech not explicitly defined in the coding scheme that will be discussed below. These purposes of social speech fell into three broad categories: joint interactions, other as a source of regulation, and non-regulatory uses of social speech.

A. Joint interactions: "I can hold it while you pour." One primary way in which children used social speech was to facilitate bi-directional interactions with social partners (primarily peers). These interactions extended beyond simple social exchanges, and required a level of cooperation between social partners. Joint interactions were classified as planning, establishing social pretense, and negotiating resources.

i. *Planning:* Children's use of social speech to engage in planning with others is one subcategory that was included in the coding scheme. Often times, planning emerged during play. For example, when two children were building a house with legos, one child (age 4.4) stated, "We still need to finish the house. Let's do the window now." Planning required that children abstract from their current actions and decide what action was needed next. Planning through social speech is quite a sophisticated ability for children who are situating both themselves and the social partners in their decision of how to accomplish their goals. This behavior was retained through the observational coding scheme of the current study.

ii. *Establishing social pretense:* Children used social speech to establish social pretense, which often occurred during fantasy or pretend play. This involved negotiating roles and rules within the episode of pretend play. For instance, when several children were negotiating their family roles in pretend play. Cameron (4.5) said to Ayla (4.4), "I'm the daddy and you're the mommy." Ayla responded, "There's no daddy in this set, so you have to be the kitty." In order to continue with the game successfully,

both partners have to agree upon the specified roles/rules. This often requires peers to compromise or make concessions in order to facilitate the game.

iii. *Negotiating resources:* In addition to negotiating roles, children also used social speech to negotiate allocation of resources (primarily toys). For instance, when two children were playing together at the water table, one child suggested (4.4), "You give me that, and you can play with this." This type of exchange is surprisingly mature for this age, for the child has to simultaneously consider both his/her own needs and the needs of their social partner. Another resource that was negotiated was play space. When two children were drawing at the art table, Adriane (3.5) told Brayden (3.7) to move because he was blocking her access to the art supplies. Brayden responded, "Hold on, just a minute." What he is doing is recognizing Adriane's need, and negotiating a solution in which he moved as soon as he finished the task he was working on.

These uses of social speech to maintain joint interactions involves a form of social regulation that is not explicitly evaluated by the observational coding scheme. Rather than using another source of information or social comparison, children are engaging in a form of co-regulation with their peers. These behaviors encompass both the regulation of oneself as well as another. This is important to recognize, because children in the current study may be engaging in particular forms of SRL more frequently and in more ways than illustrated through the quantitative findings.

B. "Other" as a source of regulation: "I do it like this?" A second way that children utilized social speech was by using others as a source for regulation. This was partially assessed

through the observational coding scheme through the codes of help-seek, expressing want/need, and task-process; however, children were also found to use social speech to scaffold their peers.

i. *Help-seeking or expressing want/need:* Children's use of social speech to seek help from others or to express their want or need of something was coded as instrumental under the coding scheme. These exchanges typically involved children verbally expressing what they wanted: "I want to sit next to Miss Kelsey."

ii. *Seeking approval from others:* In addition to seeking help from others, children often used social speech to seek approval from others based on their own performance on a task. This information was sometimes retained through the observational coding scheme through children's seeking of task-process information (asking if they were doing something correctly) and social monitoring; however, numerous examples included in field notes and the research journal were found that did not fit into this particular category of seeking approval. Rather, often children would announce to a teacher or peer their progress in order to initiate a response. A very common example involved children working in the art center on a project, and then showing their finished product to their teacher. This was depicted through social speech in a number of ways, such as, "Look, I wrote my name," "I did it!," and "Tah-dah!". This seeking of feedback or approval from others is another form of social regulation.

iii. *Scaffolding:* One social speech purpose not included in the observational coding scheme was the focal child's use of scaffolding. Although relatively infrequent as compared to other social behaviors, there were instances in which children would scaffold another child through social speech. One instance in particular involved Dani (4.9) scaffolding Aria (3.3), who was new to the classroom. Dani was showing

Aria how to play different games on the computer. As she assisted her, Dani probed Aria, asking her, "What should we do next? Want to do this one?"

Children's use of social speech to utilize social partners as a regulation source was recognized in the quantitative analysis; however, field notes and research journal entries reveal a greater variety of social regulation strategies through speech that fall outside the coding scheme.

C. Non-regulatory: "I will love to be your friend forever." Finally, children were also found to use social speech for non-regulatory purposes. These types of exchanges involved children participating in prosocial and disruptive behavior in the classroom.

i. *Prosocial:* One use of social speech that did not involve a regulatory purpose was prosocial interactions which primarily seemed to foster social relationships among peers. One example involved an exchange between Jessa (4.10) and Brayden (3.7). Jessa handed Brayden a piece of paper which she had drawn on. She then stated, "It says I will love to be your friend forever." Brayden replied, "Thank you." This interaction reflects a purely social exchange without any regulation goals.

ii. *Disruptive:* A second non-regulatory use of social speech involved children being disruptive through their use of language. This typically occurred during larger instructional activities such as circle time or story time. Disruptive speech occurred when a child was off-task during these activities, socializing or distracting a peer through the use of language. For example, in circle time, Jeremy (4.3) repeatedly yelled across the circle to Kenny to come sit next to him while Teacher E was trying to teach about the weather. Much like prosocial speech, disruptive speech often had the intention of socializing with peers.

While the primary focus of the current study was to understand the relationship between speech use and SRL, it is important to acknowledge in what other ways children used speech, and for what other intentions. Thus, it is apparent that social speech is not only a regulatory tool but also a mediator of social development.

Theme 2: Teachers' encouragement of language ("Use your words"). A second overall theme that emerged from the data involved teachers encouraging children to use language to communicate with their peers. Often, this was in response to conflicts arising between children. For example, when a conflict over resources emerged (one child took another's toy), Teacher E advised Sarah (3.7) to "use your words. Tell him how that makes you feel." Through this type of exchange, teachers are trying to foster children's independence and social competence. To that effect, teachers often try to stay removed from conflict between children, with the exception of extreme circumstances, in order for children to practice resolving their own conflicts.

Another example of this encouragement of children engaging in language involved Teacher A in response to a child named Garrett (5.0) who was crying after his social bid to join a game was rejected by a peer: "Use your words. Christopher doesn't know why you're crying, so how is he supposed to help you?" This type of exchange places value on teaching children how to communicate their feelings and emotions to others, ultimately helping children to regulate.

In addition to encouraging children to utilize language as a social tool, teachers would also model verbal strategies for children as well. For instance, when one child was hitting another child, Teacher C said to the child named Matt (3.9) being hit, "Tell him, 'stop it Kyle. I don't like that.'" The child then repeated the teacher's words to his peer. This imitation of the

teacher's use of language is a step towards these verbal strategies becoming internalized by the child.

This emphasis by teachers of children's use of language was common in all five classrooms. Ultimately, teachers appear to be providing children with the appropriate linguistic tools to handle diverse conflicts that may occur in the classroom. While this fostering of language particularly focused on social uses of language, the intent behind it is regulatory in nature. That is, teachers are trying to promote children's control or regulation over their own emotions and behaviors, thus resulting in more successful social development in the classroom.

Theme 3: Purposes of private speech. The third overarching theme identified in the field notes and research journal entries was children's diverse uses of private speech. This theme is particularly salient, because the observational coding scheme did not decipher between types of private speech; rather, it merely coded children's frequency of private speech. While children's use of private speech to engage in self-monitoring is captured in the coding scheme, field notes and research journal entries identify numerous other uses of private speech that were commonly observed across the five classrooms. When examining different types of private speech, past research has typically focused on the temporality of private speech (occurring before, during, or after a task), task-relevant versus task-irrelevant private speech, and overt versus covert private speech (Duncan & Pratt, 1997; Lee, 2011; Patrick & Abravanel, 2000; Winsler, de Leon, Wallace, Carlton, & Willson-Quayle, 2003; Winsler, Diaz, & Montero, 1997). What these distinctions do not capture is children's actual purpose for using private speech.

A. Self-monitor: "I'm afraid I'm going to mess up." One common use of private speech found in the field notes and research journal entries was children's self-monitoring. While this behavior was recognized through the observational coding scheme, the quantitative data do not

decipher between the temporality of monitoring; that is, whether a child is using private speech before, during, or after an action.

i. *Planning (private speech before action):* Much like children used social speech to plan with others, children engaged in private speech to develop independent plans. For instance, a boy named Khaylen (4.7) was building a tower with blocks and said to himself, "Now I have to build it big." According to the literature, this is a more advanced use of private speech as compared to concurrent and evaluative, for it requires children to engage in goal setting and strategy enactment (Vygotsky, 1987; Zimmerman & Schunk, 2011).

ii. *Concurrent (private speech during action):* Children, perhaps, engaged in concurrent private speech most frequently while self-monitoring, during which action and speech occurred simultaneously. For example, Brayden (3.7), one of the younger children in classroom C, often engaged in concurrent private speech. As he experimented with different ways of fitting a number of blocks into a box, he narrated out loud, "put this right here, and this right here…." Another common usage of concurrent private speech involved children counting as they completed a task, such as counting the number of train tracks they placed on the floor or the number of beads they glued onto a paper while completing the action. This type of private speech is thought to be the precursor to using private speech to plan (Vygotsky, 1987; Zimmerman & Schunk, 2011).

iii. *Evaluative (private speech after action):* Children also engaged in private speech to evaluate their performance on a task after its completion. For instance, a child named Garrett (5.0) was playing with matchbox cars, using a piece of cardboard as a ramp.

After he managed to guide the cars into a box with the ramp, he stated to himself, "I got all three in!" Thus, the purpose of his private speech was to assess or evaluate his own performance.

All three types of private speech for self-monitoring occurred in each of the classrooms; however, concurrent private speech was far more common than either planning or evaluative. Anecdotally, it seemed as though younger children (3-year-olds and young 4-year-olds) engaged primarily in concurrent private speech, while older children (older 4-year-olds and 5-year-olds) engaged in a mix of planning, concurrent, and evaluative private speech. This supports Vygotsky's (1987) argument that concurrent private speech precedes planning.

B. Making social comparisons/evaluating others: "He didn't do it right." Another way children were found to use private speech was to make social comparisons between themselves and a peer, or to evaluate a peer. This exemplifies a situation in which children use private speech to enact social forms of regulation. Children appeared to engage in this type of private speech more often during parallel play, in which they were not directly interacting with peers, as compared to engaged or reciprocal play. For example, a group of three boys were racing cars down a track. They were taking turns using the track, but not directly playing with one another. One little boy (5.0) said out loud to himself, "He didn't do it right. I'm winning the most." This form of social comparison is meant for oneself, rather than for an audience, due to the use of private speech. This exemplifies how private speech can have a social intent.

C. Internalizing what others say: "Just a little glue." One purpose of private speech not accounted for by the observational coding scheme is children's internalization of what a teacher or peer previously said. Although this may sound like simple repetition, these children are repeating words or phrases out loud which will eventually transfer into internal thought

(Vygotsky, 1987). For instance, a child named Kayla (4.8) was gluing little pieces of paper onto a large piece of construction paper to make a tree. Teacher D had previously instructed children to just use a little bit of glue when attaching the pieces of paper. As Kayla glued her pieces on, she said to herself, "Just a little glue," thereby depicting the process of internalizing the teacher's previous statements.

D. Facilitating play: "Beep beep." Another common purpose of children's private speech was to facilitate play. This materialized in a number of different ways. Children used private speech to make noises or sound effects, to create dialogue, use language symbolically, and to read or narrate to oneself.

i. *Noises/sound effects:* Children often used private speech to make noises or sound effects relevant to their current task. Typically, this involved some sort of play activity. For instance, when playing with cars or trucks, children often made sound effects such as, "Vroom," and "Beep beep." This type of private speech enhanced their engagement in play.

ii. *Dialogue:* Another way in which children facilitated their play through private speech was creating dialogue between dolls or action figures. This involved the child generating dialogue for one or more dolls/figures on his/her own.

iii. *Use symbolically:* Children also used private speech symbolically to foster play. For instance, one child (3.10) held a wooden block to his hear like a telephone, and said, "Hello." The symbolic representation of the block as a phone is made apparent through his speech.

iv. *Read/narrate to self:* Children also used private speech to read or narrate a story. This often involved a child sitting on his/her own, and talking aloud as he/she flipped

through the pages of the book. Children would either narrate the story from memory, or simply describe what was happening in the illustrations.

All four of these subcategories involve children's use of private speech to enhance or focus their play activities, thus serving some regulatory purposes.

E. Partially internalized private speech. Children's private speech that was difficult to code for content was partially internalized private speech. This often consisted of children mumbling to themselves, making it difficult to decipher the exact substance of their speech. The private speech literature considers partially internalized private speech to be a more sophisticated form as compared to completely externalized private speech; that is, partially internalized private speech marks the transition from speech into thought (Manfra & Winsler, 2006; Patrick & Abravanel, 2000; Winsler, de Leon, Wallace, Carlton, & Willson-Quayle, 2003). While most private speech is thought to be external during preschool, there were a number of instances in the observed classrooms where children use partially internalized speech, depicting this transition of private speech into inner thought.

F. Singing/humming. Finally, a common use of private speech not captured by the observational coding scheme was a child's singing or humming to him/herself. Past research categorizes this type of private speech as off-task or task-irrelevant (Winsler, de Leon, Wallace, Carlton, & Willson-Quayle, 2003; Winsler, Diaz, & Montero, 1997). I, however, argue otherwise. Numerous times, a child would be working on a task while either singing or humming to oneself. Instead of distracting the child, this private speech appeared to be keeping the child's focus on the present task, thereby blocking out other distractions. Although the specific content of their private speech may not be advancing their progress on the task, the impact of the speech does appear to be helpful in this advancement.

These different categories of private speech found in my field notes and research journal are important; they illustrate the many different purposes for using private speech in the classroom that extend beyond simply self-monitoring and the quantitative analysis.

Summary of Qualitative Analysis

Using the field notes and research journal, a qualitative content analysis revealed three overall themes. Among these themes was children's different uses of social speech, which involved both regulatory and non-regulatory actions. Next, teachers were found to frequently model verbal strategies to children regarding conflict resolution with peers, thereby linking the first two themes. Finally, children's purposes for engaging in private speech were found to be much more variable than indicated by the observational coding scheme, alone.

Chapter Summary

In summary, children's language and SRL were examined through both quantitative and qualitative analyses. Quantitative analyses revealed that children's engagement in both speech and SRL differed by social and physical dimensions of the classroom environment. The qualitative analysis revealed that children's engagement in both private and social speech extended beyond the uses highlighted in the observational coding scheme, thus filling in some of the gaps left by the quantitative analyses. The use of both analytical lenses provided a rich, thick description of the complex ways in which young children use language to navigate the classroom environment. The following chapter will include a discussion of these findings, study limitations, and future directions for research and practice.

Chapter 5: Discussion

The present study hypothesized that language may serve as a potential mediator in children's early self-regulated learning (SRL) skills in the preschool classroom. Because low-income children have been found to exhibit lower SRL abilities (Vassallo, 2012; 2013), identifying factors linked to emerging SRL is essential in potential interventions. Quantitative analyses found that proximity to social partners was related to children's engagement in both speech and SRL behaviors, in which proximity to social partner partners was positively associated with social behaviors (social speech and social regulation) and negatively associated with solitary behaviors (private speech and independent regulation). Additionally, the play context appeared to foster higher levels of all speech and SRL behaviors; however, the relationship between language and SRL is more complex. Path analyses revealed that the role of speech mediating the link between global vocabulary and SRL in the classroom functions differently depending on the current classroom context or activity. These findings are supported by Social Constructivist Theory's three major tenets: the importance of context, social interactions, and language in children's early cognitive development.

Social Partners' Impact on Use of Speech and SRL

Children's proximity to social partners (peers and teachers) was linked to their engagement in speech. In particular, children's amount of private speech was negatively associated with the number of peers (and teachers) in close proximity to them. This suggests that the more social partners present, the less likely children are going to rely on private speech. This is supported by past literature which found a negative impact of social partners on private speech (Winsler, Carlton, & Barry, 2000). Could this indicate that peers may distract children from using private speech, or are children simply more socially motivated in the presence of peers?

In addition to private speech, proximity to social partners also impacted children's use of social speech. Social speech peaked when in the presence of a small number of peers (dyad or small group), indicating the type of social environment in which social interactions may flourish. When children are solitary, they likely have very limited social opportunities, and when in a large group the number of peers may be distracting or overwhelming. It is also important to consider that when children are in a large group of peers (greater than 5 peers), they are likely in an instructional activity, such as circle time; thus, their opportunities for social interactions would naturally be restricted by the structure of the activity imposed by the teacher. This could explain why many children utilize low levels of both types of speech in large groups. Teacher proximity had no effect on children's engagement in social speech. The present study did not account for who the child was directing speech towards, so it is unclear how much social speech was intended for peers versus teachers. This would be an interesting follow-up study, for it could shed light on how children are utilizing their social network when engaging in SRL. For instance, past research has found that children who seek help from teachers have better academic outcomes compared to those who do not (Demirtas, 2013). This type of interaction requires the child to take an active role in his/her learning, recognizing that he/she needs help, and actively obtaining assistance from another.

Children's proximity to social partners was also associated with their SRL behaviors. Children's engagement in independent regulation was significantly lower when children were in a large group of peers compared to other social contexts, indicating that a large number of peers may be a distraction. This yields important implications for how teachers can more effectively structure classroom activities, avoiding the creation of too many large group activities that do not appear to be beneficial to the development of SRL. One reason for children's less frequent

engagement in SRL in large group activities could be the greater variation in their zones of proximal development. This variation creates more difficulty for the teacher when providing appropriate scaffolding for children, for some children may need less assistance while others require more. Conversely, when interacting with a small group of children, teachers may be better able to address individual students' needs.

Additionally, social regulation was highest when children were in a dyad and small group of peers, similar to social speech. Social speech and social regulation are both socially-oriented behaviors, and the results suggest that a small number of peers may provide better opportunities for these types of interactions. Teacher proximity negatively impacted children's independent regulation, but had no impact on children's social regulation. This finding is important because it provides evidence that teacher involvement may not always be beneficial in promoting autonomous learning. This contrasts with previous research that found that teacher proximity actually supports children's task engagement and behavior regulation, and introduces an important direction of future research (Hester, Hendrickson, & Gable, 2009; Test & Cornelius-White, 2013). Perhaps it is linked to the specific definition of independent regulation used in the current study. This regulation strategy requires children to monitor their learning without the assistance of an external source. While teachers' scaffolding of young children is essential in the development of SRL, it is also important for the teacher to recognize when the child is capable of completing a task on his/her own in fostering independent regulation (Bruner, 1996, Wood, Bruner, & Ross, 1976). When teachers are proximal, they may over-regulate for the child in order to hold the child's engagement, rather than allowing the child to focus his/her own attention on the task at hand. It could also be that when teachers are in close proximity, children rely on their assistance more heavily, thus resulting in higher levels of social regulation as

compared to independent regulation. Thus, the present study yielded evidence of both positive and negative effects of teacher proximity on children's SRL. Future research should more closely examine the impact that teachers' presence has on children's SRL, and how the changing activities and access to peers affects this relationship.

In addition to teacher proximity, past research has found that the way in which the teacher structures the classroom also impacts children's learning and participation (Stipek, Feiler, Daniels, & Milburn, 1995). Specifically, child-centered classrooms, which emphasize the social climate of the classroom, yielded favorable outcomes as compared to didactic classrooms. An important direction of future research is to tease apart the effects of teacher proximity and context to determine which is driving this effect on children's SRL.

Past research focuses less on the amount of social interactions and structure of the social environment, and more on the purpose of those interactions (Demirtas, 2013; McTigue & Liew, 2011; Newman, 2000). Social partners serve as sources of information, help or scaffolding, and social comparison. While teachers are a primary form of support for preschoolers, the findings of this study suggest that children's social speech towards their peers may have a unique impact on their SRL. Social Constructivist Theory situates the role of others in this early development. While Vygotsky argued the importance of more-skilled others (such as a teacher), Piaget held that same-skilled peers were also essential to cognitive development, for these interactions allowed for the challenging of children's thinking, ultimately leading to cognitive restructuring (Piaget & Inhelder, 1969; Vygotsky, 1987). Both types of interactions seem necessary in cognitive development; therefore, classrooms that capitalize on the benefits of these social interactions will likely foster higher levels of SRL in children. Thus, it is essential that children have access to both teacher and peers, but also have opportunities to engage in problem-solving

independently when capable. A challenge for teachers is striking a balance between the two, determining when to intervene and when to let a child be.

Link between Global Vocabulary and Speech Use

Children's global vocabulary scores varied dramatically by individual children. The path analyses supported the hypothesis that children's global vocabulary would predict their use of speech in the classroom. This relationship was also context-dependent. Global vocabulary predicted children's engagement of social speech during play activities and private speech during instructional activities. This indicates that speech is serving different purposes depending on the particular structure of the classroom environment. While in play, children have more opportunities to engage in social interactions through the use of language. During instructional activities, children have more restrictions placed on them, and thus are not engaging in the same frequency of social interactions.

Instructional activities are typically characterized as being closed-ended and goal-directed. Past research has found that open-ended and self-selected activities result in higher amounts of children's private speech (Krafft & Berk, 1998; Winsler, Carlton, & Barry, 2000). This does not contradict the findings of the current study; rather it helps explain the role of global vocabulary on private speech. In general, children may use private speech more frequently in open-ended activities associated with play contexts, but in close-ended instructional activities children's use of private speech is dependent on global vocabulary. Children with higher vocabularies utilize private speech more frequently during instruction contexts compared to children with lower vocabularies.

Interestingly, no direct links between global vocabulary and SRL outcomes were found in the current study. This supports the hypothesis that global vocabulary functions through

children's use of speech to predict SRL behaviors. This is further supported by the indirect effect of global vocabulary on social regulation as mediated by frequency of children's social speech (in the play context). The LAP-D has previously been found to have high interrater reliability and internal consistency, supporting the argument that it is a good measure to track children's development over time (Hardin & Peisner-Feinberg, 2001). Head Start, in particular, assesses children using the LAP-D three times across the school year. A future study should look at the change in children's vocabulary scores over an academic year in relation to their speech and SRL behaviors in the classroom. Additionally the language subtests of the LAP-D have been strongly linked to teachers' referrals of particular children, suggesting that this assessment also has predictive validity (Crane, Winsler, & Sands, 2013).

One potential reason why global vocabulary is not directly linked to SRL is that vocabulary may not be representative of children's global language abilities. Because the LAP-D only assesses vocabulary, children's other linguistic skills, such as their syntactical structure and mean length of utterances, are not accounted for. Perhaps a more cumulative language assessment would provide a better estimate of children's true language abilities. Additionally, although children's vocabulary is assessed by Head Start three different times throughout the year (beginning, middle, end), the measures used in the present study are from the first assessment taken at the beginning of the school year. Some children are just entering preschool for the first time, and being in an unfamiliar setting may affect their performance on these assessments. Even most children who had attended Head Start the previous year were meeting their new teachers for the first time in a different classroom. Thus, a follow-up study might focus on the change in children's language scores across the year in relation to children's use of speech and SRL.

Link between Speech and SRL

Similar to the relationship between global vocabulary and speech, the relationship between speech and SRL was also context-dependent as hypothesized. Social speech positively predicted social regulation in the play context and both social and independent regulation in the instruction context. Private speech negatively predicted social regulation in the play context and positively predicted social regulation in the instruction context. This link between private speech and social regulation suggests that there is a social nature to private speech. Although private speech is by definition meant for oneself, there may be valuable social intentions behind its use. Interestingly, private speech was not linked to independent regulation in either context. This is possibly due to limitations of the coding system of the present study that do not decipher between types of private speech.

The qualitative findings shed light on these results. From the field notes and research journal, it is apparent that children's uses of private speech surpass the categories included on the observational coding scheme. This is important to note because private speech may be a more sophisticated ability than previously thought. Beyond the purpose of self-monitoring, children were found to use private speech to make social comparisons, facilitate play, internalize the speech of others, and focus their attention through singing/humming. Each of these private speech types may foster SRL in different ways. While social comparisons allow children to use private speech to engage in social regulation, internalizing the language of others ultimately uses social partners as a means of independent regulation. Therefore, simply looking at the general link between private speech and independent and social regulation ignores the specific roles that types of private speech may play. Future research should investigate these different uses of private speech and how they differentially contribute to SRL in the classroom.

One limitation of the present study involves the inability to decipher the content of partially internalized private speech. Despite partially internalized private speech being considered more advanced than external private speech, as it is transitioning into inner thought, there has not been an effective way of examining the content of it in preschool children (Manfra & Winsler, 2000; Patrick & Abravanel, 2000; Winsler, de Leon, Wallace, Carlton, & Willson-Quayle, 2003). Without this understanding, it is difficult to assess the role of partially internalized private speech on SRL without relying on children's self-report. A future study could enact the use of body microphones on children in the classroom to better capture this partially internalized private speech. Subsequently, the experimenter could then replay the audio recording to the child and ask what he/she was thinking at the time. This could provide insight into the child's true intentions when utilizing private speech.

A future study should also examine whether profiles of private speech can be identified in preschoolers. That is, do some children rely on concurrent private speech more often while others rely on planning or evaluative private speech? Do some children use private speech in more rudimentary ways, such as facilitating play, while others are more focused on self-monitoring? Do some children primarily use private speech to engage independent regulation while others focus on social regulation? Explicating these potential private speech profiles could better explain how language abilities predict private speech, as well as the link between private speech and SRL.

Gender Differences

One gender difference was found in the tested models. In the play context, boys were found to engage in independent regulation more frequently than girls. A previous study by Lee and McDonough (2015) found the opposite relationship, with girls exhibiting higher self-

regulation skills than boys. The current findings may not indicate that boys are better regulators than girls; rather, it could depict that in play activities, girls are more socially oriented, thus resulting in less frequent independent regulation. This notion is supported by past research which has found that girls exhibit higher social skills in preschool than boys, including higher amounts of prosocial behavior, less externalizing behavior, and more frequent engagement in interactive play with peers (Coolahan, Fantuzzo, Mendez, & McDermott, 2000; Walker, 2005; Winsler & Wallace, 2002). Therefore, the gender difference found in the play context model may be more representative of differences in social interactions rather than regulation skills.

Another issue to consider is what else is contributing to independent regulation. With the exception of social speech in the instruction context, independent regulation was relatively disconnected to the rest of the hypothesized model. Perhaps there are more nonverbal indicators of these monitoring behaviors that do not manifest through language. If so, it would be important to identify what these behaviors are so that teachers can more effectively promote and model such strategies for children with lower language abilities. Observations were used as the primary method of data collection in the current study because they provide a naturalistic look at children's abilities; however, there may be some regulation behaviors that are not clearly observable. Past research has relied heavily on self-reports when assessing students' SRL (Barnard-Brak, Paton, & Lan, 2010; Heikkila & Lonka, 2006; Ning & Downing, 2015). This strategy is problematic with young children because of the sophisticated linguistic and cognitive abilities required to self-report. Additionally, other-report measures of SRL have been used in which teachers evaluate children's engagement in SRL (Pratt, Lipscomb, & McClelland, 2015; Xu, Benson, Mudrey-Camino, & Steiner, 2010). Alone, this strategy may not be sufficient, but in combination with classroom observations, teacher-report could highlight aspects of children's

SRL that observations may miss. Future research should enact a combination of observations and teacher-report to provide a more comprehensive view of developing SRL abilities in preschool children and determine what other factors are linked to children's engagement in independent regulation.

Limitations

One limitation of the current study involves the location from which the sample of participants was drawn. Participants were recruited from five preschool classrooms at a single Head Start center. Head Start itself is a very particular environment, with certain rules and regulations that must be followed. Thus, the daily classroom routines may look very different from those of other, less-structured low-income preschools. Therefore, interpretation of the findings cannot be generalized to the greater population of low-income children. Future research should extend this approach of studying the role of language on SRL by context to a greater population of low-income children, including both urban and rural settings. Additionally, the sample size of the present study limited the ability to detect anything but relatively strong relationship; increasing the sample size in a future study may reveal additional significant findings.

An additional limitation results from children being nested within classrooms. Although each classroom was physically structured in similar ways (e.g., each classroom had comparable centers and materials), the ways in which teachers facilitated classroom learning were markedly different. Classrooms differed in both amount and type of instruction (large group vs. small group), as well as overall teacher practice and decision-making. As a result, these classrooms differences may have impacted the findings of the present study.

A final limitation involves the current study's sole focus on an English-speaking sample. While there were a number of dual-language learners in several of the observed classrooms, the current study did not have the resources to properly collect data on these children. Despite a number of observations being conducted on Spanish-speaking children, neither of the two observers spoke Spanish; therefore, when a dual-language learner spoke in Spanish, observers were only able to record that the child used speech. No information about content of that speech could be ascertained. As a result, these data on dual-language learners was excluded from the analyses. Because the present study places such a strong emphasis on classroom environment (both physical and social dimensions), understanding how these cross-cultural elements impact children's language and SRL is an important question to investigate in future studies.

Implications for Intervention and Practice

Classroom environment. The present study has a number of implications for teachers' structuring of the preschool classroom. The findings illustrate that children's language and SRL function differently depending on context. Thus, it is important for teachers to include both structured (instruction context) and unstructured (play context) activities throughout the day. In doing so, teachers will provide a variety of opportunities for children to engage in both social and independent regulation behaviors. Additionally, it is essential for teachers to provide appropriate materials and space in the classroom, which act as mediational tools for children's SRL. Children's speech and SRL behaviors were inhibited in the presence of too many peers. This could be the result of the layout of a classroom not providing children with enough space to engage in activities, whether instructional or play. This argument is supported by Cuffaro (1995), who maintained that how a teacher utilizes the classroom space strongly impacts children's classroom behavior.

In Head Start classrooms, free play is characterized by children choosing to play in a number of different learning centers. In most classrooms, teachers set a cap on how many children can play in each center at a time. This common rule may prevent children's space from becoming overcrowded; however, this structure also prevents children from moving freely from one activity to another. Cuffaro (1995) argued that this free movement should be a primary goal of how a teacher creates the physical environment. Therefore, careful consideration of how to balance children's space and free movement in the classroom is needed.

Usefulness of small group activities. Quantitative analyses revealed that large group activities do not appear to be particularly beneficial in promoting children's SRL. Thus, solely relying on large group instructional activities may not provide children with sufficient opportunities to practice regulation skills. Conversely, one particular context or activity that may be beneficial to the emergence of SRL is small group instructional activities. The present study yields evidence that most speech and SRL behaviors flourish when in the presence of a small number of peers. Therefore, this structure of the social environment may better promote the emergence of SRL through language. In the five classrooms observed, children often had the opportunity to engage in play activities with a small group of peers; however, less common were opportunities to engage in instructional activities in small groups. This particular instructional context would provide children with opportunities to both independently regulate, as well as use peers as a regulation source.

What is important during these activities is for teachers to capitalize on children's growing autonomy, thereby allowing them to lead some of the activity themselves. One such example involves Teacher A working with a group of five children on a literacy activity. She first read them a story about bats. Following the story, she had planned for the children to each

make their own bat using construction paper, incorporating the knowledge they had learned from the story (e.g., bats have large wings). Rather than telling them how to make their bats, Teacher A instructed, "I'm going to show you how I make my bat, and then I want you to show me how you make yours." This exchange allowed her to provide the children with some direction, while still permitting children to make their own choices and develop their own strategies.

Children's amount of experience engaging in small group instructional activities varied significantly by classroom. Teachers in Classrooms A and D had built into their daily schedule children's participation in small literacy groups. These activities typically involved the teacher initially leading the activity (e.g., reading a story) followed by a more child-centered activity, such as the example mentioned above. Classrooms C and E occasionally incorporated small group instructional activities into center time, allowing (and sometimes requiring) children to choose to engage in such activities. These activities typically involved small group story time or an art project situated in the current curriculum theme (e.g., making a cave when learning about animals that hibernate). Finally, Classroom B rarely provided the opportunity for children to engage in small group instruction. Future research should explore the success of this type of activity in promoting children's engagement in SRL. If found to be a successful mediator for regulation, it would have important implications for how the daily classroom activities should be structured.

Teachers' modeling language. One major theme found in the field notes and research journal was teachers' encouragement of children to "use your words." This was one way in which teachers framed the use of verbal strategies for children. In turn, children imitated these strategies. The purpose of this modeling is for children to eventually internalize these linguistic strategies, thereby enacting them without being prompted by the teacher. While this verbal

modeling appeared to be somewhat successful, it primarily focused on children's attempts at conflict resolution with peers. Teachers could also be modeling verbal regulation strategies as well, prompting children to engage in private speech to formulate plans, monitor their progress, and evaluate their performance among other uses of private speech. Peeters et al. (2014) recognizes teachers modeling SRL strategies as being an important facilitator of this cognitive development. Furthermore, by modeling language strategies for enacting this regulation, teachers can provide children with the necessary tools to successfully engage in SRL.

Chapter Summary

In conclusion, the present study explicated the importance of language in children's enactment of SRL. Children's global vocabulary determined their use of private and social speech in the classroom. In turn, children's classroom speech predicted their engagement in SRL. These behaviors differed depending on both social and physical dimensions of the classroom context. These findings yield important implications for both future research and teacher practice. Future research should further tease apart the role of social and physical dimensions of the classroom context, thereby informing teacher practice. By structuring the classroom in ways that best promote the emergence of SRL in low-income children, teachers can potentially limit the negative outcomes associated with delayed development of regulation skills.

References

Alarcón-Rubio, D., Sánchez-Medina, J. A., & Prieto-García, J. R. (2014). Executive function and verbal self-regulation in childhood: Developmental linkages between partially internalized private speech and cognitive flexibility. *Early Childhood Research Quarterly*, *29*(2), 95-105.

Avineri, N., Johnson, E., Brice-Heath, S., McCarty, T., Ochs, E., Kremer-Sadlik, T., ... & Paris, D. (2015). Invited forum: Bridging the "language gap." *Journal of Linguistic Anthropology*, *25*(1), 66-86.

Barnard-Brak, L., Paton, V. O., & Lan, W. Y. (2010). Profiles in self-regulated learning in the online learning environment. *The International Review of Research in Open and Distributed Learning*, *11*(1), 61-80.

Berk, L. E., & Garvin, R. A. (1984). Development of private speech among low-income Appalachian children. *Developmental Psychology*, *20*(2), 271-284.

Berk, L. E., & Spuhl, S. T. (1995). Maternal interaction, private speech, and task performance in preschool children. *Early Childhood Research Quarterly*, *10*, 145-169.

Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist*, *57*(2), 111-127.

Bodrova, E. & Leong, D. J. (1996). *Tools of the mind: The Vygotskian approach to early childhood education.* Englewood Cliffs, NJ: Prentice-Hall.

Bodrova, E., & Leong, D. J. (2003). Learning and development of preschool children from the Vygotskian perspective. In A. Kozulin, B. Gindis, V. S. Ageyeu, & S. M. Miller (Eds.), *Vygotsky's educational theory in cultural context* (pp. 156-176). Cambridge, UK: Cambridge University Press.

Boekaerts, M. (1999). Self-regulated learning: Where we are today. *International Journal of Educational Research*, *31*(6), 445-457.

Boekaerts, M., & Corno, L. (2005). Self-regulation in the classroom: A perspective on

assessment and intervention. *Applied Psychology: An International Review, 54*(2), 199-231.

Bos, W., & Tarnai, C. (1999). Content analysis in empirical social research. *International Journal of Educational Research, 31,* 659-671.

Brooks-Gunn, J., & Duncan, G. J. (1997). The effects of poverty on children. *The Future of Children, 7*(2), 55-71.

Brown, T. A. (2006). *Confirmatory factor analysis for applied research.* New York: The Guilford Press.

Bruner, J. S. (1983). Play, thought, and language. *Peabody Journal of Education, 60*(3), 60-90.

Bruner, J. S. (1996). *The culture of education*. Cambridge, MA: Harvard University Press.

Butler, R., & Ruzany, N. (1993). Age and socialization effects on the development of social comparison motives and normal ability assessments in Kibbutz and urban children. *Child Development, 64*(2), 532-543.

Case, R. (1992). The role of the frontal lobes in the regulation of cognitive development. *Brain and Cognition, 20,* 51–73.

Chafel, J. A. (1984). Social comparisons by young children in classroom contexts. *Early Child Development and Care, 14*(1-2), 109-124.

Chatzipanteli, A., Grammatikopoulos, V., & Gregoriadis, A. (2014). Development and evaluation of metacognition in early childhood education. *Early Child Development and Care, 184*(8), 1223-1232.

Coolahan, K. C., Fantuzzo, J., Mendez, J., & McDermott, P. (2000). Preschool peer interactions and readiness to learn: Relationships between classroom peer play and learning behaviors and conduct. *Journal of Educational Psychology, 92,* 458-465.

Coplan, R. J., & Arbeau, K. A. (2009). Peer interactions and play in early childhood. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 143-161). New York: The Guilford Press.

Craig, H. K., & Washington, J. A. (2006). Malik goes to school: Examining the language skills

of African American students from preschool-5th grade. Mahwah, NJ: Lawrence Erlbaum Associates.

Craig, H. K., Zhang, L., Hensel, S. L., & Quinn, E. J. (2009). African American English-speaking students: An examination of the relationship between dialect shifting and reading outcomes. *Journal of Speech, Language, and Hearing Research, 52,* 839-855.

Crane, J., Winsler, A., & Sands, B. (2013). Patterns of referral recommendations for ethnically diverse children in subsidized child care. *Exceptional Children, 80*(1), 45-64.

Crichton, N. A. (2000). Defining and assessing competence: Issues and debates. *Journal of Clinical Nursing*, *9*(3), 369-381.

Cuffaro, H. K. (1995). *Experimenting with the world: John Dewey and the early childhood classroom.* New York: Teacher's College.

Curenton, S. M. (2011). Understanding the landscapes of stories: The association between preschoolers' narrative comprehension and production skills and cognitive abilities. *Early Child Development and Care*, *181*(6), 791-808.

Day, K. L., & Smith, C. L. (2013). Understanding the role of private speech in children's emotion regulation. *Early Childhood Research Quarterly*, *28*(2), 405-414.

Del Rio, P., & Alvarez, A. (2007). Inside and outside the zone of proximal development: An ecofunctional reading of Vygotsky. In H. Daniels, M. Cole, & J. V. Wertsch (Eds.), *The Cambridge companion to Vygotsky* (pp. 276-303). New York: Cambridge University Press.

Demirtas, V. Y. (2013). Self-regulation strategies of the six-year-old preschool children. *International Journal of Academic Research, 5*(2), 264-273.

Denham, S. A., Blair, K. A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach–Major, S., & Queenan, P. (2003). Preschool emotional competence: Pathway to social competence? *Child Development*, *74*(1), 238-256.

Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education.* New York: MacMillan Company.

Dijkstra, P., Kuyper, H., van der Werf, G., Buunk, A. P., & van der Zee, Y. G. (2008). Social comparison in the classroom: A review. *Review of Educational Research, 78*(4), 828-879.

Duncan, O. D. (1975). *Introduction to structural equation models*. New York: Academic Press.

Duncan, R. M., & Pratt, M. W. (1997). Microgenetic change in the quantity and quality of preschoolers' private speech. *International Journal of Behavioral Development, 20*(2), 367-383.

Elias, C. L., & Berk, L. E. (2002). Self-regulation in young children: Is there a role for sociodramatic play? *Early Childhood Research Quarterly*, *17*(2), 216-238.

Elo, S., & Kyngas, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62*(1), 107-115.

Evertson, C. M., & Weinstein, C. S. (2006). *Handbook of classroom management: Research, practice, and contemporary issues.* Malwah, NJ: Lawrence Erlbaum Associates.

Fernyhough, C. & Fradley, E. (2005). Private speech on an executive task: Relations with task difficulty and task performance. *Cognitive Development, 20,* 103-120.

Fisher, R. (1998). Thinking about thinking: Developing metacognition in children. *Early Child Development and Care, 141*(1), 1-15.

Fox, E. & Riconscente, M. (2008). Metacognition and self-regulation in James, Piaget, and Vygotsky. *Educational Psychology Review, 20*(4), 373-389.

Gardner-Neblett, N., Pungello, E. P., & Iruka, I. U. (2012). Oral narrative skills: Implications for the reading development of African American children. *Child Development Perspectives, 6*(3), 218-224.

Garton, A. F. (1992). *Social interaction and the development of language and cognition.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Girbau, D. (2002). A sequential analysis of private and social speech in children's dyadic communication. *The Spanish Journal of Psychology, 5*(2), 110-118.

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research:

Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today, 24*, 105-112.

Graue, M. E., Whyte, K. L., & Karabon, A. E. (2015). The power of improvisational teaching. *Teaching and Teacher Education*, *48*, 13-21.

Hammer, C. S., Farkas, G., & Maczuga, S. (2010). The language and literacy development of Head Start children: A study using the Family and Child Experiences Survey database. *Language, Speech, and Hearing Services in Schools, 41*(1), 70-83.

Harden, B. J., & Peisner-Feinberg, E. S. (2001). *The early learning accomplishment profile (early LAP) examiner's manual and reliability and validity technical report.* Lewisville, NC: Kaplan Press.

Harris, K. R. (1990). Developing self-regulated learners: The role of private speech and self-instructions. *Educational Psychologist*, *25*(1), 35-49.

Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brooks Publishing.

Heikkila, A., & Lonka, K. (2006). Studying in higher education: Students' approaches to learning, self-regulation, and cognitive strategies. *Studies in Higher Education, 31*(1), 99-117.

Hester, P. P., Hendrickson, J. M., & Gable, R. A. (2009). Forty years later: The value of praise, ignoring, and rules for preschoolers at risk for behavior disorders. *Education and Treatment of Children*, *32*(4), 513-535.

Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review, 26,* 55-88.

Hoff, E. (2013). Interpreting the early language trajectories of children from low-SES and language minority homes: Implications for closing the achievement gaps. *Developmental*

Psychology, 49(1), 4-14.

Hoff, E., & Naigles, L. (2002). How children use input to acquire lexicon. *Child Development, 73*(2), 418-433.

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15*(9), 1277-1288.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55.

Huynh, H., & Feldt, L. S. (1976). Estimation of the Box correction for degrees of freedom from sample data in randomized block and split-plot designs. *Journal of Educational and Behavioral Statistics, 1*(1), 69-82.

Iiskala, T., Vauras, M., Lehtinen, E., & Salonen, P. (2011). Socially shared metacognition of dyads of pupil in collaborative mathematical problem-solving processes. *Learning and Instruction, 21*(3), 379-393.

Jarvela, S. & Jarvenoja, H. (2011). Socially constructed self-regulated learning and motivation regulation in collaborative learning groups. *Teachers College Record, 113*(2), 350-374.

Knoxville-Knox County Community Action Committee (2015). Knoxville-Knox County Head Start/Early Head Start: 2015 annual report. Retrieved from http://www.knoxcac.org/newweb/programs-services/head-start.

Krafft, K. C., & Berk, L. E. (1998). Private speech in two preschools: Significance of open-ended activities and make-believe play for verbal self-regulation. *Early Childhood Research Quarterly, 13*(4), 637-658.

Kuppens, S., Holden, G., Barker, K., & Rosenberg, G. (2011). A Kappa-related Decision:[kappa], Y, G, or AC^ sub 1^. *Social Work Research, 35*(3), 185-189.

Labaree, R. V. (2002). The risk of 'going observationalist': Negotiating the hidden dilemmas of being an insider participant observer. *Qualitative Research, 2*(1), 97-122.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*(1), 159-174.

Larkin, S. (2010). *Metacognition in young children.* New York, NY: Routledge.

Larson, J. C. G., & Suchy, Y. (2014). The contribution of verbalization to action. *Psychological Research,* 1-19, doi:10.1007/s00426-014-0586-0.

Lee, S. W. F. (2011). Exploring seven-to eight-year-olds' use of self-talk strategies. *Early Child Development and Care, 181*(6), 847-856.

Lee, S., & McDonough, A. (2015). Role of self-talk in the classroom: Investigating the relationship of eight-to-nine-year-olds' self-regulatory self-talk strategies with their classroom self-regulatory behavior and mathematical achievement. *Early Child Development and Care*, *185*(2), 198-208.

Lidstone, J. S. M., Meins, E., & Fernyhough, C. (2010). The roles of private speech and inner speech in planning during middle childhood: Evidence from a dual task paradigm. *Journal of Experimental Child Psychology, 107*, 438-451.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry* (Vol. 75). London: Sage.

Linver, M. R., Brooks-Gun, J., & Kohen, D. E. (2002). Family processes as pathways from income to young children's development. *Developmental Psychology, 38*(5), 719-734.

Luria, A. R. (1961). *The role of speech in the regulation of nor- mal and abnormal 114ehavior*. New York: Liveright.

Mallory, B. L., & New, R. S. (1994). Social constructivist theory and principles of inclusion: Challenges for early childhood special education. *The Journal of Special Education, 28*(3), 322-337.

Manfra, L., & Winsler, A. (2006). Preschool children's awareness of private speech. *International Journal of Behavioral Development, 30*(6), 537-549.

McRobbie, C., & Tobin, K. (1997). A social constructivist perspective on learning environments.

International Journal of Science Education, 19(2), 193-208.

McTigue, E., & Liew, J. (2011). Principles and practices for building academic self-efficacy in middle grades language arts classrooms. *The Clearing House, 84,* 114-118.

Menting, B., vanLier, P. A. C., & Koot, H. M. (2011). Language skills, peer rejection, and the development of externalizing behavior from kindergarten to fourth grade. *Journal of Child Psychology and Psychiatry, 52*(1), 72-79.

Metallidou, P. (2012). Epistemological beliefs as predictors of self-regulated learning strategies in middle school students. *School Psychology International, 34*(3), 283-298.

Meyers, A. B., & Berk, L. E. (2014). Make-believe play and self-regulation. In E. Booker, M. Blaise, & S. Edwards (Eds.) *Sage handbook of play and learning in childhood* (pp. 43-55). London: Sage Publications.

Miller, P. J., & Sperry, D. E. (2012). Déjà vu: The continuing misrecognition of low-income children's verbal abilities. In S. T. Fiske & H. R. Markus (Eds.), *Facing social class: How societal rank influences interaction* (pp. 109-130). New York: Russell Sage Foundation.

Montessori, M. (1995). *The absorbent mind.* New York: Henry Holt and Company.

Moos, D. C., & Ringdal, A. (2012). Self-regulated learning in the classroom: A literature review on the teacher's role. *Education Research International, 2012.*

Morgan, P. L., Farkas, G., Hillemeier, M. M., Hammer, C. S., & Maczuga, S. (2015). 24-month-old children with larger oral vocabularies display greater academic and behavioral functioning at kindergarten entry. *Child Development, 86*(5), 1351-1370.

Morris, S. B., & Deshan, R. P. (2002). Combining effect size estimates in meta-analysis with repeated measures and independent-groups designs. *Psychological Methods, 7*(1), 105-125.

Nandagopal, K., & Ericsson, K. A. (2012). An expert performance approach to the study of

individual differences in self-regulated activities in upper-level college students. *Learning and Individual Differences*, *22*(5), 597-609.

Neitzel, C . L., & Connor, L. (under review). Differences in kindergarteners' participation and regulation strategies across time and instructional contexts. *Journal of Research in Childhood Education.*

Neitzel, C. L., & Stright, A. D. (2003). Mothers' scaffolding of children's problem-solving: Establishing a foundation of academic self-regulatory competence. *Journal of Family Psychology, 17*(1), 147-159.

Newman, R. S. (2000). Social influences on the development of children's adaptive help-seeking: The role of parents, teachers, and peers. *Developmental Review, 20,* 350-404.

Newman, R. S. (2002). How self-regulated learners cope with academic difficulty: The role of adaptive help-seeking. *Theory into Practice, 41*(2), 132-138.

Ning, H. K., & Downing, K. (2015). A latent profile analysis of university students' self-regulated learning strategies. *Studies in Higher Education, 40*(7), 1328-1346.

Ohtani, K., Okada, R., Ito, T., & Nakaya, M. (2013). A multilevel analysis of classroom goal structures' effects on intrinsic motivation and peer modeling: Teachers' promoting interaction as a classroom level mediator. *Psychology*, *4*(8), 629-637.

Palincsar, A. S. (1998). Social constructivist perspectives on teaching and learning. *Annual Review of Psychology, 49*, 345-375.

Paris, S. G., Byrnes, J. B., & Paris, A. H. (2001). Constructing theories, identities, and actions of self-regulated learners. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement: Theoretical perspectives, 2nd edition* (pp. 253-287). Erlbaum.

Parten, M. B. (1932). Social participation among preschool children. *The Journal of Abnormal and Social Psychology, 27*(3), 243-269.

Patrick, E., & Abravanel, E. (2000). The self-regulatory nature of preschool children's private speech in a naturalistic setting. *Applied Psycholinguistics, 21,* 45-61.

Peeters, J., DeBacker, F., Reina, V. R., Kindekens, A., Buffel, T., & Lombaerts, K. (2014). The role of teachers' self-regulatory capacities in the implementation of self-regulated learning practices. *Social and Behavioral Sciences, 116,* 1963-1970.

Perels, F., Merget-Kullmann, M., Wende, M., Schmitz, B., & Buchbinder, C. (2009). Improving self-regulated learning of preschool children: Evaluation of training for kindergarten teachers. *British Journal of Educational Psychology, 79,* 311-327.

Perry, N. E. (1998). Young children's self-regulated learning and the contexts that support it. *Journal of Educational Psychology*, *90*(4), 715-729.

Perry, N. E., & VandeKamp, K. J. O. (2000). Creating classroom contexts that support young children's development of self-regulated learning. *International Journal of Educational Research, 33,* 821-843.

Peshkin, A. (1988). In search of subjectivity- One's own. *Educational Researcher*, *17*(7), 17-21.

Piaget, J. (1951). *Play, dreams and imitation in childhood*. London: Routledge.

Piaget, J., & Inhelder, B. (1969). *The psychology of the child.* New York: Basic Books, Inc.

Pratt, M. E., Lipscomb, S. T., & McClelland, M. M. (2015). Caregiver Responsiveness During Preschool Supports Cooperation in Kindergarten: Moderation by Children's Early Compliance. *Early Education and Development,* 1-19. Doi:10.1080/10409289.2016.1090767.

Pungello, E. P., Iruka, I. U., Dotterer, A. M., Millis-Koonce, R., & Reznick, S (2009). The effects of socioeconomic status, race and parenting on language development in early childhood. *Developmental Psychology*, *45*(2), 544-557.

Reese, E., Sparks, A., & Levya, D. (2010). A review of parent interventions for preschool

children's language and emergent literacy. *Journal of Early Childhood Literacy, 10*(1), 97-117.

Reilley, S., Wake, M., Ukoumunne, C., Bavin, E., Prior, M., Cini, E., …Bretherton, L. (2010). Predicting language outcomes at 4 years of age: Findings from early language in Victoria study. *Pediatrics, 126*(6), e1530-e1537.

Rice, M. L. (1989). Children's language acquisition. *American Psychologist, 44*, 149-156.

Rodriguez, E. T., Tamis-LeMonda, C. S., Spellmann, M. E., Pan, B. A., Raikes, H., Lugo-Gil, J., & Luze, G. (2009). The formative role of home literacy experiences across the first three years of life in children from low-income families. *Journal of Applied Developmental Psychology, 30,* 677-694.

Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context.* New York, NY: Oxford University Press.

Rubin, K. H., Maioni, T. L., & Hornung, M. (1976). Free play behaviors in middle-and lower-class preschoolers: Parten and Piaget revisited. *Child Development, 47*(2), 414-419.

Schmitt, S. A., Pratt, M. E., & McClelland, M. M. (2014). Examining the validity of behavioral self-regulation tools in predicting preschoolers' academic achievement. *Early Education and Development, 25*(5), 641-660.

Shamir, A., Mevarech, Z. R., & Gida, C. (2009). The assessment of meta-cognition in different contexts: Individualized vs. peer assisted learning. *Metacognition Learning, 4*, 47-61.

Skibbe, L. E., Connor, C. M., Morrison, F. J., & Jewkes, A. M. (2011). Schooling effects on preschoolers' self-regulation, early literacy, and language growth. *Early Childhood Research Quarterly, 26,* 42-49.

Smit, K., de Brabander, C. J., & Martens, R. L. (2013). Student-centred and teacher-centred learning environment in pre-vocational secondary education: Psychological needs, and motivation. *Scandinavian Journal of Educational Research, 58*(6), 695-712.

Stipek, D, Feiler, R., Daniels, D., and Milburn, S. (1995). Effects of different instructional approaches on young children's achievement and motivation. *Child Development, 66*(1), 209-223.

Stright, A. D., Neitzel, C., Sears, K. G., & Hoke-Sinex, L. (2001). Instruction begins in the home: Relations between parental instruction and self-regulation in the classroom. *Journal of Educational Psychology, 93*(3), 456-466.

Tamis-LeMonda, C. S., Bornstein, M. H., & Baumwell, L. (2001). Maternal responsiveness and children's achievement of language milestones. *Child Development, 72*(3), 748-767.

Test, J. E., & Cornelius-White, J. H. D. (2013). Relationships between the timing of social interactions and preschoolers' engagement in preschool classrooms. *Journal of Early Childhood Research Quarterly.* Doi:10.1177/1476718X12466217.

Tobin, K. (1993). *The practice of constructivism in science education.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Tobin, K. (1998). Sociocultural perspectives on the teaching and learning of science. In M. Larochelle, N. Bednarz, & J. Garrison (Eds.), *Constructivism and education* (pp. 15-212). New York, NY: Cambridge University Press.

Tobin, K. (2015). The sociocultural turn in science education and its transformative potential. In C. Milne, K. Tobin, & D. DeGennaro (Eds.), *Sociocultural studies and implications for science education* (pp. 3-31). Springer Netherlands.

Tobin, K., Briscoe, C., & Holman, J. R. (1990). Overcoming constraints to effective elementary science teaching. *Science Education, 74*(4), 409-420.

Tobin, K., & Dawson, G. (1992). Constraints to curriculum reform: Teachers and the myths of schooling. *Educational Technology Research and Development, 40*(1), 81-92.

Vallotton, C., & Ayoub, C. (2011). Use you words: The role of language in the development of toddlers' self-regulation. *Early Childhood Research Quarterly, 26,* 169-181.

Van Oers, B. (2003). Learning resources in the context of play: Promoting effective learning in early childhood. *European Early Childhood Education Research Journal, 11*(1), 7-26.

Vassallo, S. (2012). Observations of a working class family: Implications for self-regulated learning development. *Educational Studies, 48*(6), 501-529.

Vassallo, S. (2013). Considering class-based values related to guardian involvement and the development of self-regulated learning. *New Ideas in Psychology, 31*(3), 202-211.

Vermetten, Y. J., Lodewijks, H. G., & Vermut, J. D. (2001). The role of personality traits and goal orientations in strategy use. *Contemporary Educational Psychology, 26*(2), 149-170.

Vygotsky, L. S. (1962). *Thought and language*. E. Hanfman & G. Vakar (Eds.). Cambridge, MA: MIT Press.

Vygotsky, L. S. (1967). Play and its role in the mental development of the child. *Soviet Psychology, 5*(3), 6-18.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological functions.* Cambridge, MA: Harvard University Press.

Vygotsky, L. S. (1987). *The collected works of L. S. Vygotsky: Volume 1, problems of general psychology.* R. W. Rieber & A. S. Carton (Eds.). New York, NY: Plenum Press.

Vygotsky, L. S. (1987). *The collected works of L. S. Vygotsky: Volume 4, the history of the development of higher mental functions.* R. W. Rieber & A. S. Carton (Eds.). New York, NY: Plenum Press.

Walker, S. (2005). Gender differences in the relationship between young children's peer-related social competence and individual differences in theory of mind. *The Journal of Genetic Psychology, 166*(3), 297-312.

Wertsch, J. V. (1991). *Voices of the mind: A sociocultural approach to mediated action.* Cambridge, MA: Harvard University Press.

Whitebread, D., Coltman, P., Pino Pasternak, D., Sangster, C., Grau, V., Bingham, S., …

Demetriou, D. (2009). The development of two observational tools for assessing metacognition and self-regulated learning in young children. *Metacognition Learning, 4,* 63-85.

Whitebread, D., & O'Sullivan, L. (2012). Preschool children's social pretend play: Supporting the development of metacommunication, metacognition, and self-regulation. *International Journal of Play, 1*(2), 197-213.

Winsler, A., Carlton, M. P., & Barry, M. J. (2000). Age-related changes in preschool children's systematic use of private speech in a natural setting. *Journal of Child Language, 27*(3), 665-687.

Winsler, A., de Leon, J. R., Wallace, B . A., Carlton, M. P., & Willson-Quayle, A. (2003). Private speech in preschool children: Developmental stability and change, across-task consistency, and relations with classroom behavior. *Journal of Child Language, 30,* 583-608.

Winsler, A., Diaz, R. M., & Montero, I. (1997). The role of private speech in the transition from collaborative to independent task performance in young children. *Early Childhood Research Quarterly, 12*(1), 59-79.

Winsler, A., Ducenne, L., & Koury, A. (2011). Singing one's way to self-regulation: The role of early music and movement curricula and private speech. *Early Education and Development, 22*(2), 274-304.

Winsler, A., & Naglieri, J. (2003). Overt and covert verbal problem-solving strategies: Developmental trends in use, awareness, and relations with task performance in children aged 5 to 17. *Child Development, 74*(3), 659-678.

Winsler, A., & Wallace, G. (2002). Behavior problems and social skills in preschool children: Parent-teacher agreement and relations with classroom observations. *Early Education and Development, 13*(1), 41-58.

Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of*

Child Psychology and Psychiatry, *17*(2), 89-100.

Xu, M., Benson, S. N. K., Mudrey-Camino, R., & Steiner, R. P. (2010). The relationship between parental involvement, self-regulated learning, and reading achievement of fifth graders: A path analysis using the ECLS-K database. *Social Psychology of Education*, *13*(2), 237-269.

Yip, M. C. (2009). Differences between high and low academic achieving university students in learning and study strategies: A further investigation. *Educational Research and Evaluation*, *15*(6), 561-570.

Zimmerman, B. J. (1986). Development of self-regulated learning: Which are the key sub-processes? *Contemporary Educational Psychology, 16,* 307-313.

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81*(3), 329-339.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, *41*(2), 64-70.

Zimmerman, B. J., & Pons, M. M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal*, *23*(4), 614-628.

Zimmerman, B. J., & Schunk, D. H. (Eds.) (1989). *Self-regulated learning and academic achievement: Theory, research, and practice.* New York: Springer-Verlag.

Zimmerman, B. J. & Schunk, D. H. (Eds.) (2001). *Self-regulated learning and academic achievement: Theoretical perspectives* (2nd edition). Mahwah, NJ: Lawrence Erlbaum Associates.

Zimmerman, B. J., & Schunk, D. H. (2008). Motivation: An essential dimension of self-regulated learning. In D. H. Schunk & B. J. Zimmerman (Eds.), *Motivation and self-regulated learning: Theory, research, and applications* (pp. 1-30). New York, NY:

Lawrence Erlbaum Associates.

Zimmerman, B. J., & Schunk, D. H. (2011) *Handbook of self-regulation of learning and performance.* New York, NY: Routledge.

Zuffiano, A., Alessandri, G, Gerbino, M., Kanacri, B. P. L., Giunta, L. D., Milioni, M., Caprara, G. V. (2013). Academic achievement: The unique contribution of self-efficacy beliefs in self-regulated learning beyond intelligence, personality traits, and self-esteem. *Learning and Individual Differences, 23,* 158-162.

Appendices

Appendix A

Consent for Child's Participation in Head Start Diverse Contexts Project

Dear Parent or Guardian,

Dr. Carin Neitzel and Dr. Hillary Fouts, professors in the Department of Child and Family Studies, will be doing a research study in your child's classroom at Head Start. We would like to invite your child to take part in this research. The purpose of the research is to learn more about the ways young children develop and maintain friendships in diverse group settings in early childhood classrooms. This letter describes what we will do in the research and asks you to give permission for your child take part in the research study.

What will my child be asked to do?
Your child will let us observe and record his/her regular activities in the classroom. During the study, a research assistant will observe and record your child's learning and play experiences and interaction patterns with their teachers and peers who are like them and not like them. The research assistant will only be observing your child's interactions; she will not be directing your child to do any specific activities in the classroom or on the playground. The researcher assistant will simply watch and write notes about the way your child participates, interacts, and plays in the classroom.

What will happen in the classroom?
A research assistant will come to your child's classroom 3-4 mornings per week. All researchers involved are experienced in working with young children; however, the researchers will not interact with your child beyond common courtesies. The research assistant will not ask the teacher to alter the classroom schedule in any way. The research assistant will simply observe the usual activities planned by the teacher.

What other information do you want to collect about my child?
We would like your permission to see and record background information, developmental and language test scores from assessments that have already been given by the staff of Head Start and maintained in your child's file at the Center.

Does my child have to do this?
No, your child does not have to take part in the research. Taking part in the research is completely voluntary. If you decide that you do not want your child to take part in the research it will not affect his/her enrollment or experiences at Head Start in any way.

If you say "yes" now but change your mind later, you can drop out at any time by contacting Dr. Carin Neitzel or Dr. Hillary Fouts or by telling the Director of your child's Head Start program. If you withdraw from the study, data gathered to that point will be retained for analysis to the extent necessary for completing the research.

If your child does not want to be observed or becomes upset on one of the observation days, we will attempt to collect data on a different day. If your child does not want to participant or becomes upset again on three consecutive days, we will not attempt to observe again.
If your child does not participate, the researchers will not write down notes about any of his/her activities.

Does it cost me or my child anything to participate?
No, there is no cost to you or your child for participating.

Who will see the notes taken about my child's activities?
Notes will be taken on all children who take part in this study. Only the researchers will be able to see the notes that are taken. Dr. Neitzel and Dr. Fouts will keep notes in locked storage.

Will others know that my child is taking part in this research?
Your child's teachers, the Head Start Director and staff will know your child is taking part in this research. We will do a number of things to try to keep people not involved in the research from knowing which children are participating. Your child will be referred to by id number only in all notes taken. If you agree to allow us to access background and test information from your child's file, that data will not contain identifiable information and will be placed in a file containing only the assigned id number. Thus your child's identity will be protected.

What are the risks and inconveniences of taking part in this research?
We do not believe this study presents any serious risks or inconveniences to your child. Because the research activities will occur in the classroom as part of the children's usual activities, your child may not even be able to tell that he or she is part of a research study.

What are the benefits of taking part in this research?
Your child's participation will provide us with important information about how young children develop and maintain peer relationships that will be invaluable for understanding how to best design early childhood educational environments.

If I want my child to participate, what do I have to do?
Please sign this consent form and return it to the sealed box located inside your child's classroom or give it to the Center Director or your child's teacher when you arrive with your child at the Center. Please keep a copy of the consent form for your records.

What if I have questions?
If you have any questions, please contact Dr. Carin Neitzel (615) 957-5872, cneitzel@utk.edu or Dr. Hillary Fouts hfouts@utk.edu. If you have questions regarding this research or about giving consent to participate in the research, please call the University of Tennessee, Knoxville, Office of Research Compliance Officer at (865) 974-7697.

Thank you very much!

Sincerely,

Carin Neitzel, Ph.D. and Hillary N. Fouts, Ph.D.,
Department of Child & Family Studies, University of Tennessee

STATEMENT BY PARENT/GUARDIAN AGREEING TO CHILD'S RESEARCH PARTICIPATION
I have read or have had read to me the description of the research study. The investigator or her representative has explained the study to me and has answered all of the questions I have at this time, and I freely and voluntarily choose to allow my child's to participate in this research. I agree to allow my child to be observed for research purposes. I agree to allow the researchers to look at information from my child's Head Start file. I understand that this research is voluntary and that I may withdraw my consent at any time.

_____ _____
Printed name of child **Child's Birth date**

_____ _____
Printed name of Parent/guardian **Today's Date**

_____
Parent/guardian's signature





Photographs of Classroom A



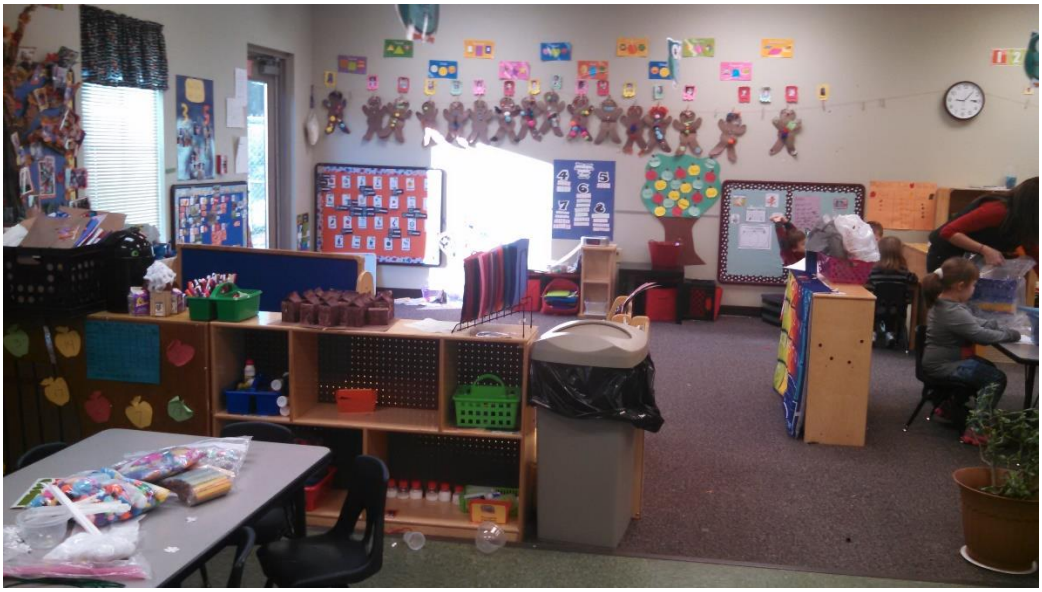


Photographs of Classroom B





Photographs of Classroom C/E





Photographs of Classroom D

Code Sheet

1.INTERACTION

Partner none_ dyad_ smallgroup_ large group_ teacher_ *(choose)*

Language Used **English 0 1 2**

Other 0 1 2

Social Bids	**EAccept**	**OAccept**	**TAccept**	*(Tally)*
	EReject	**OReject**	**TReject**	
Peer Invites	**AcceptE**	**AcceptO**	**AcceptT**	*(Tally)*
	RejectE	**RejectO**	**RejectT**	

2. ROLES / CONSTRUCTION

SOCIAL ROLES.				**SOCIAL CONSTRUCTION STRATEGIES**			
Directive.	**0**	**1**	**2**	**Self referencing**	**0**	**1**	**2**
Supportive.	**0**	**1**	**2**	**Social referencing**	**0**	**1**	**2**
Follower/Passive.	**0**	**1**	**2**	**Normative appeals**	**0**	**1**	**2**
Disruptive	**0**	**1**	**2**				

3. INTERACTION FUNCTION

1. **Information share** *(Tally)*

Inform **suggest-reason**

elaborate– extend **connect–associate**

meta talk: ***performance*** ***strategies***

1. **Regulate.** *(Tally)*

Command	EAccept	OAccept	EIgnore	OIgnore
Corrective	EAccept	OAccept	EIgnore	OIgnore
Affection	EAccept	OAccept	EIgnore	OIgnore

2. **Instrumental** (get something) *(Tally)*

Want/Need	Ereceived	Oreceived	Treceived
	Edenied	Odenied	Tdenied
Help Seek	Ereceived	Oreceived	Treceived
	Edenied	Odenied	Tdenied

3. **Heuristic** (ask questions) *(Tally)*

Added Info	Ereceived	Oreceived	Treceived
	Edenied	Odenied	Tdenied
Task-Process	Ereceived	Oreceived	Treceived
	Edenied	Odenied	Tdenied
How I'm doing	Ereceived	Oreceived	Treceived
	Edenied	Odenied	Tdenied

1. **Evaluation** *(Tally)*

Peer /Other	English	Other	Teacher
Monitor			
Self			
Social			

2. **Planning** w/English w/Other w/Teacher
3. **Social** w/English w/Other w/Teacher
4. **Antagonism** Eaccepted Oaccepted Edisputed Odisputed
5. **Self Talk** **0** **1** **2**

4. PARTNER
PARTNER INFORMATION EXCHANGE (Tally)

1.	**Content/Directions**	EPeer	OPeer	Teacher
2.	**Basic Question**	EPeer	OPeer	Teacher
3.	**Deep Level Question**	EPeer	OPeer	Teacher
4.	**Explanation**	EPeer	OPeer	Teacher
5.	**Perform feedback**	EPeer	OPeer	Teacher
6.	**Mastery feedback**	EPeer	OPeer	Teacher
7.	**Social**	EPeer	OPeer	Teacher
8.	**Corrective**	EPeerResp	OPeerResp	TeacherResp
		EPeerRej	OPeerRej	TeacherRej

PARTNER RESPONSIVENESS

1.	**Accept Input**	EPeer	OPeer	Teacher
2.	**Follow Lead**	EPeer	OPeer	Teacher
3.	**Recast**	EPeer	OPeer	Teacher
4.	**Perspective take**	EPeer	OPeer	Teacher
5.	**Refer to Other**	byEPeer	byOPeer	byTeacher
	Referral	toEPeer	toOPeer	toTeacher
6.	**Antagonism**	EPeer	OPeer	Teacher

PARTNER INSTRUCTION CHARACTERISTIC

Directive – Teacher **0** **1** **2** Peer **0** **1** **2**
Reciprocal – Teacher **0** **1** **2** Peer **0** **1** **2**
Conflict- Teacher **0** **1** **2** Peer **0** **1** **2**
Affection- Teacher **0** **1** **2** Peer **0** **1** **2** **Context: I P**

Example of post-observation field notes

Coding Packet Cover Page

Participant ID #153 *(Fill in)*

Observation # 4 *(Fill in)*

Context:	instruct_✓	group_	center_	play_	*(choose)*
Proximity	solitary_	solitary/near_	parallel_	engaged_✓	*(choose)*

Social Partners _____ *(list ID numbers)*

In small group instruction w/ Miss K., Braydon, + Britta
- Miss K. reading book about animals; J would act out animal parts (e.g. kicked up legs to be a donkey)
- very engaged in book
- used private speech when first looking at book alone
- used social speech to make connections when Miss K. reading book aloud ("This gives us exercise")
- also engaged in self-monitoring through social speech
    - informed Miss K.; "I can't read."
- Miss K. scaffolded her; helped her try to figure out what a camel was
    - used mastery feedback "It's not a llama, but a ____": "It has a hump on it's back."
- all instruction intervals

Example of on-the-spot field notes

putting on clothes in pretend play

w/ Vi, Britta, + Sarah

1.INTERACTION

Partner	none_	dyad_	smallgroup_	large group_	teacher_	*(choose)*
Language Used		English	0	1	2	
		Other	0	1	2	

Social Bids	EAccept	OAccept	TAccept	*(Tally)*
	EReject	OReject	TReject	
Peer Invites	AcceptE	AcceptO	AcceptT	*(Tally)*
	RejectE	RejectO	RejectT	

2. ROLES / CONSTRUCTION

SOCIAL ROLES.

Directive.	0	1	2
Supportive.	0	1	2
Follower/Passive.	0	1	2
Disruptive	0	1	2

SOCIAL CONSTRUCTION STRATEGIES

Self referencing	0	1	2
Social referencing	0	1	2
Normative appeals	0	1	2

3. INTERACTION FUNCTION

1. **Information share** *(Tally)*
   - Inform
   - elaborate– extend
   - meta talk: *performance*
   - suggest–reason
   - connect–associate
   - *strategies*

"I'm gonna put these shoes on."

2. **Regulate.** *(Tally)*

Command	EAccept	OAccept	EIgnore	OIgnore
Corrective	EAccept	OAccept	EIgnore	OIgnore
Affection	EAccept	OAccept	EIgnore	OIgnore

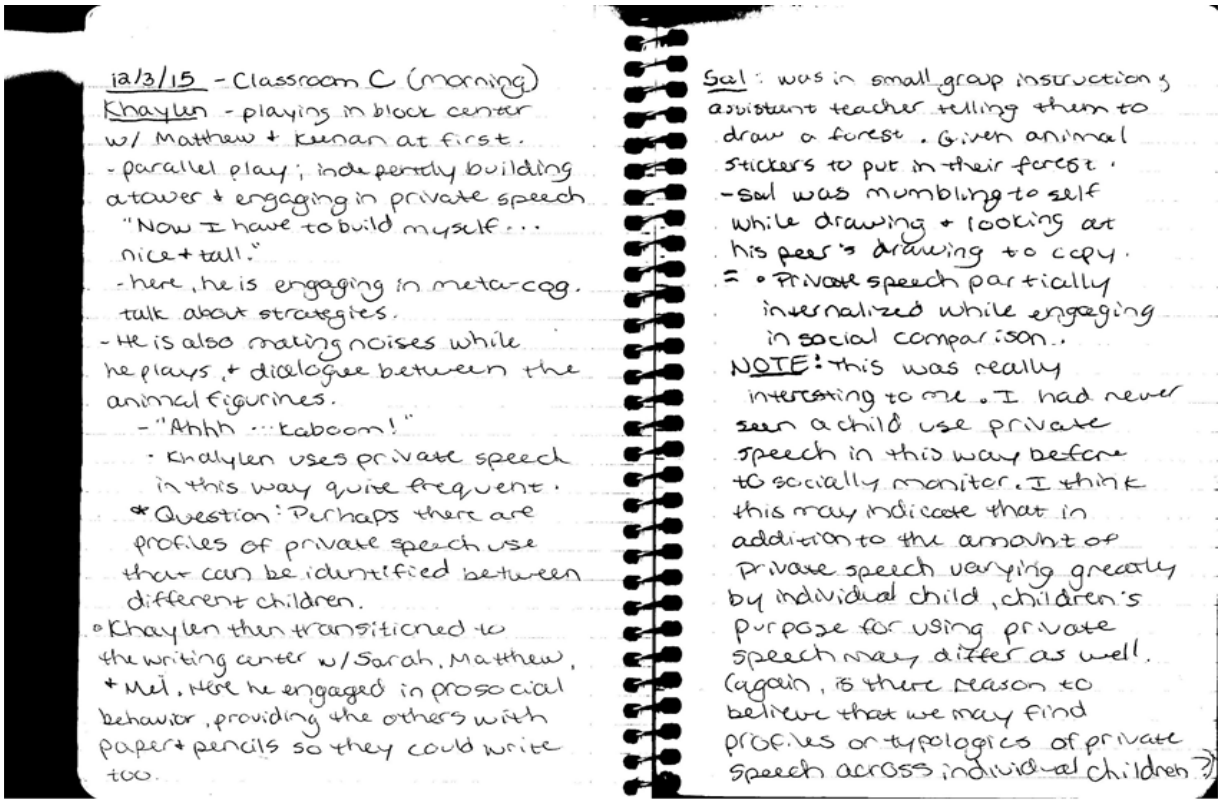
3. **Instrumental** (get something) *(Tally)*

Want/Need	Ereceived	Oreceived	Treceived
	Edenied	Odenied	Tdenied
Help Seek	Ereceived	Oreceived	Treceived
	Edenied	Odenied	Tdenied

4. **Heuristic** (ask questions) *(Tally)*

Added Info	Ereceived	Oreceived	Treceived
	Edenied	Odenied	Tdenied
Task-Process	Ereceived	Oreceived	Treceived
	Edenied	Odenied	Tdenied

Excerpt from Research Journal



12/3/15 - Classroom C (morning)
Khaylen - playing in block center w/ Matthew + Keenan at first.
- parallel play; independently building a tower & engaging in private speech "Now I have to build myself... nice + tall."
- here, he is engaging in meta-cog. talk about strategies.
- He is also making noises while he plays, + dialogue between the animal figurines.
- "Ahhh ... kaboom!"
- Khaylen uses private speech in this way quite frequent.
* Question: Perhaps there are profiles of private speech use that can be identified between different children.
- Khaylen then transitioned to the writing center w/ Sarah, Matthew, + Mel. Here he engaged in prosocial behavior, providing the others with paper + pencils so they could write too.

Sal: was in small group instruction; assistant teacher telling them to draw a forest. Given animal stickers to put in their forest.
- Sal was mumbling to self while drawing + looking at his peer's drawing to copy.
= • Private speech partially internalized while engaging in social comparison.
NOTE: this was really interesting to me. I had never seen a child use private speech in this way before to socially monitor. I think this may indicate that in addition to the amount of private speech varying greatly by individual child, children's purpose for using private speech may differ as well. (again, is there reason to believe that we may find profiles or typologies of private speech across individual children?)

Appendix B

Table 5

Assessing interrater reliability (kappa statistics, standard errors, and 95% confidence intervals)

Variable	Kappa	Standard Error	95% CI
Metacognitive talk (performance)	.42*	.08	[.25, .57]
Metacognitive talk (strategies)	.69*	.09	[.51, .83]
Self-monitor	.63*	.05	[.53, .71]
Want/need	.64*	.06	[.51, .74]
Help-seek	.57*	.17	[.20, .86]
Information seek	.62*	.05	[.52, .71]
Task-process	.71*	.16	[.33, .93]
Plan	.92*	.06	[.78. 1.00]
Social monitor	.64*	.09	[.43, .81]
Private speech	.71*	.02	[.67, .75]
Social speech	.64*	.02	[.61,.67]

Note. $*p < .001$. 95% confidence intervals were obtained through bootstrapping 1,000 samples in SPSS.

Table 6

Means (and Standard Deviations) for Speech and Regulation Behaviors by Social Partner and Context

Proximity to Peers	Private Speech	Social Speech	Independent Regulation	Social Regulation
Solitary	0.46 (0.39)	0.42 (0.29)	0.06 (0.08)	0.09 (0.10)
Dyad	0.29 (0.17)	0.86 (0.30)	0.06 (0.07)	0.15 (0.09)
Small Group	0.20 (0.14)	0.85 (0.31)	0.07 (0.09)	0.13 (0.08)
Large Group	0.06 (0.07)	0.65 (0.29)	0.01 (0.02)	0.04 (0.04)
Proximity to Teacher				
Teacher Present	0.10 (0.07)	0.75 (0.24)	0.04 (0.05)	0.11 (0.06)
Teacher Not Present	0.39 (0.21)	0.69 (0.32)	0.07 (0.06)	0.10 (0.07)
Context				
Instruction	0.10 (0.07)	0.68 (0.25)	0.04 (0.05)	0.08 (0.06)
Play	0.32 (0.18)	0.80 (0.29)	0.07 (0.07)	0.13 (0.07)

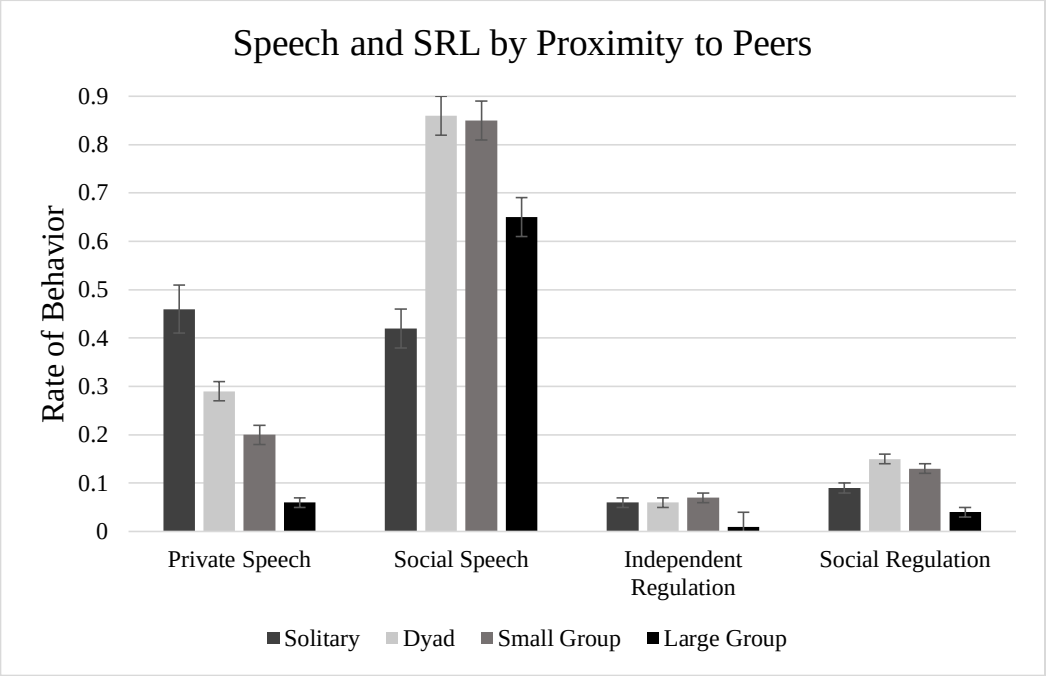


Figure 5. Graph of differences in speech and SRL behaviors by proximity to peers.

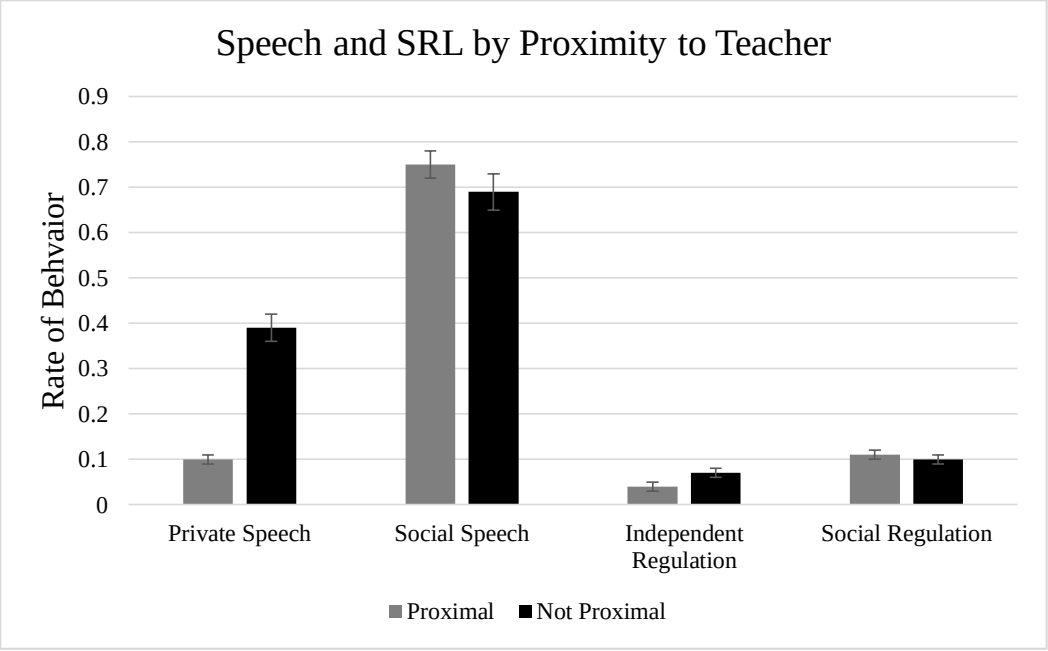


Figure 6. Graph of differences in speech and SRL behaviors by proximity to teacher.

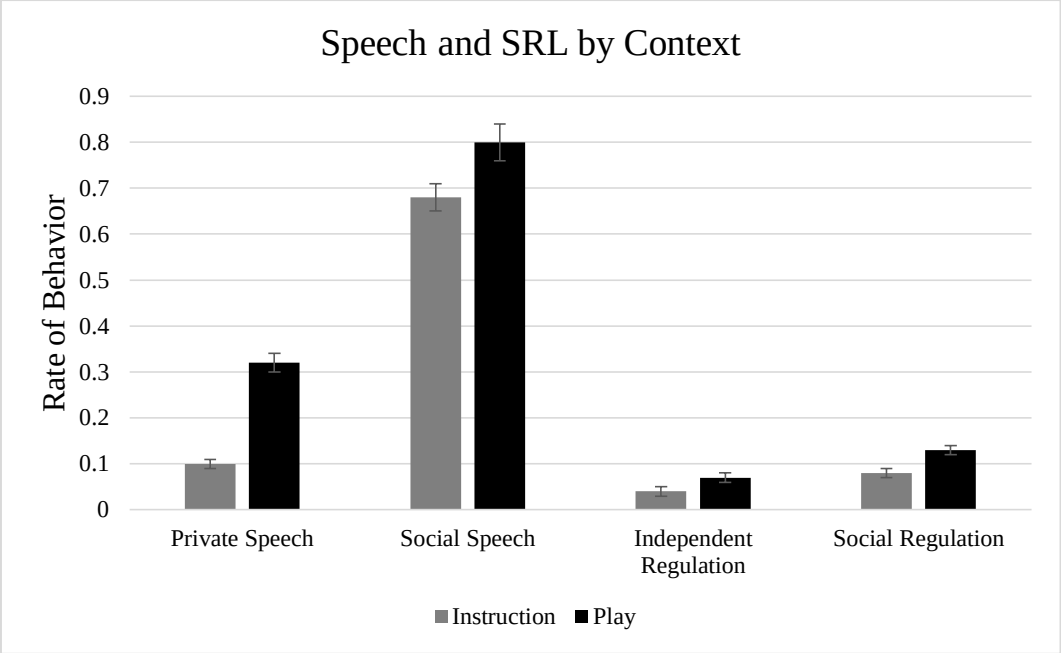


Figure 7. Graph of differences in speech and SRL behaviors by classroom context.

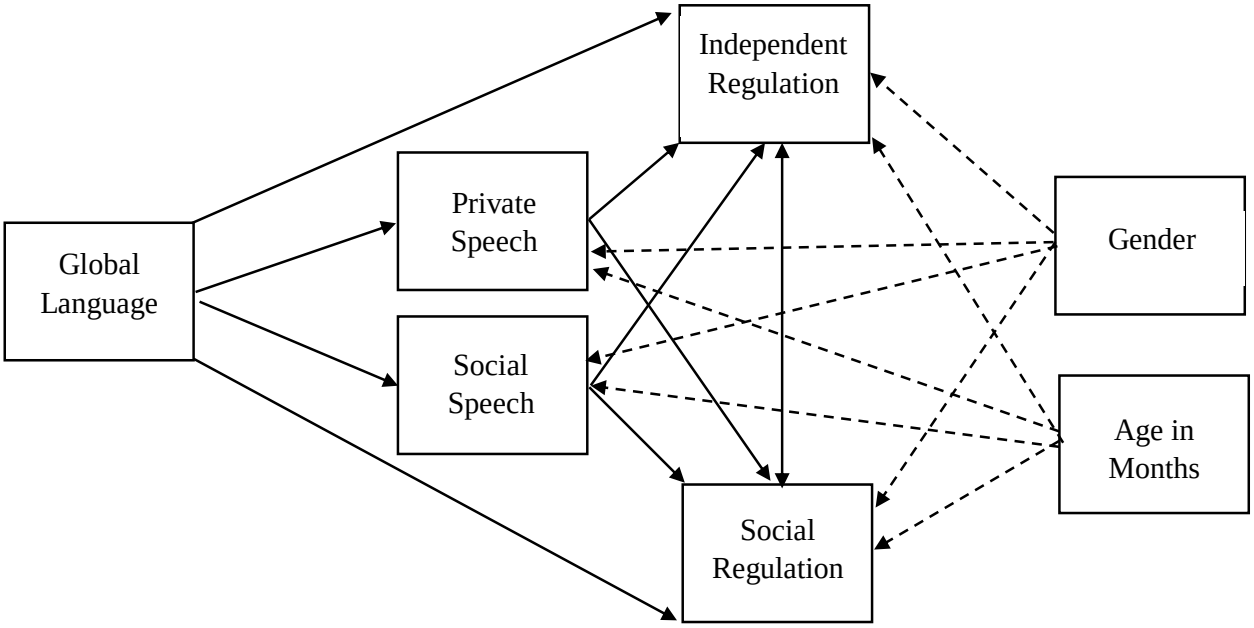


Figure 8. Path diagram with semi-partial covariate effects

Note. Covariate effects represented by dashed line.

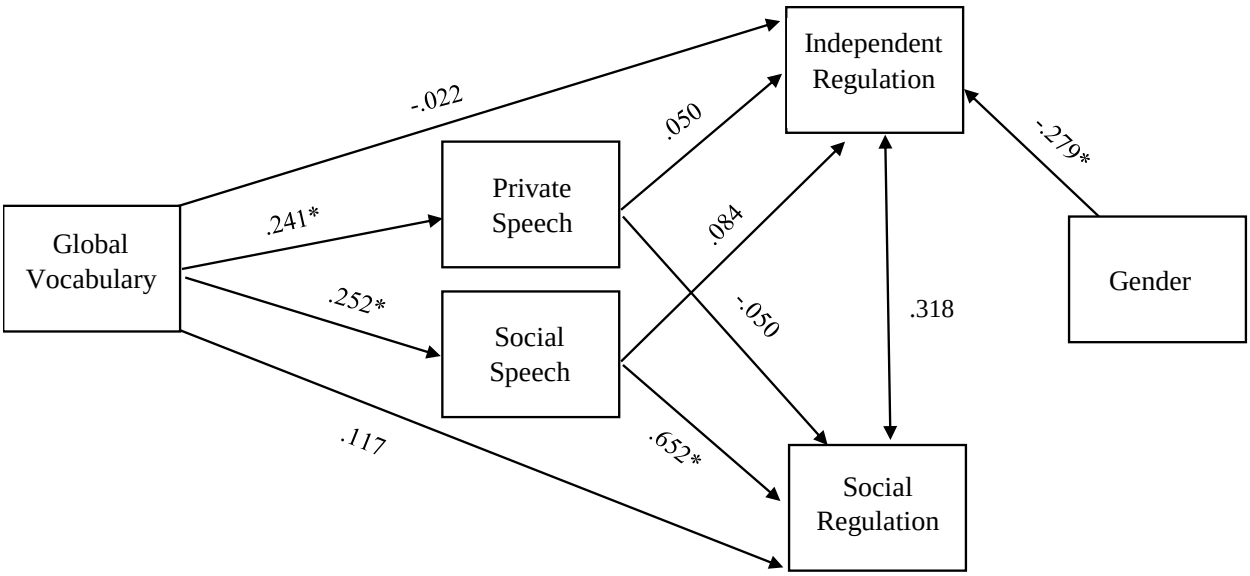


Figure 9. Path diagram of saturated Model 1 (collapsed across contexts)

$\chi^2(4) = 2.664$; RMSEA = .000, confidence intervals [.000, .166]; CFI = 1.000; TLI = 1.105; SRMR = .042

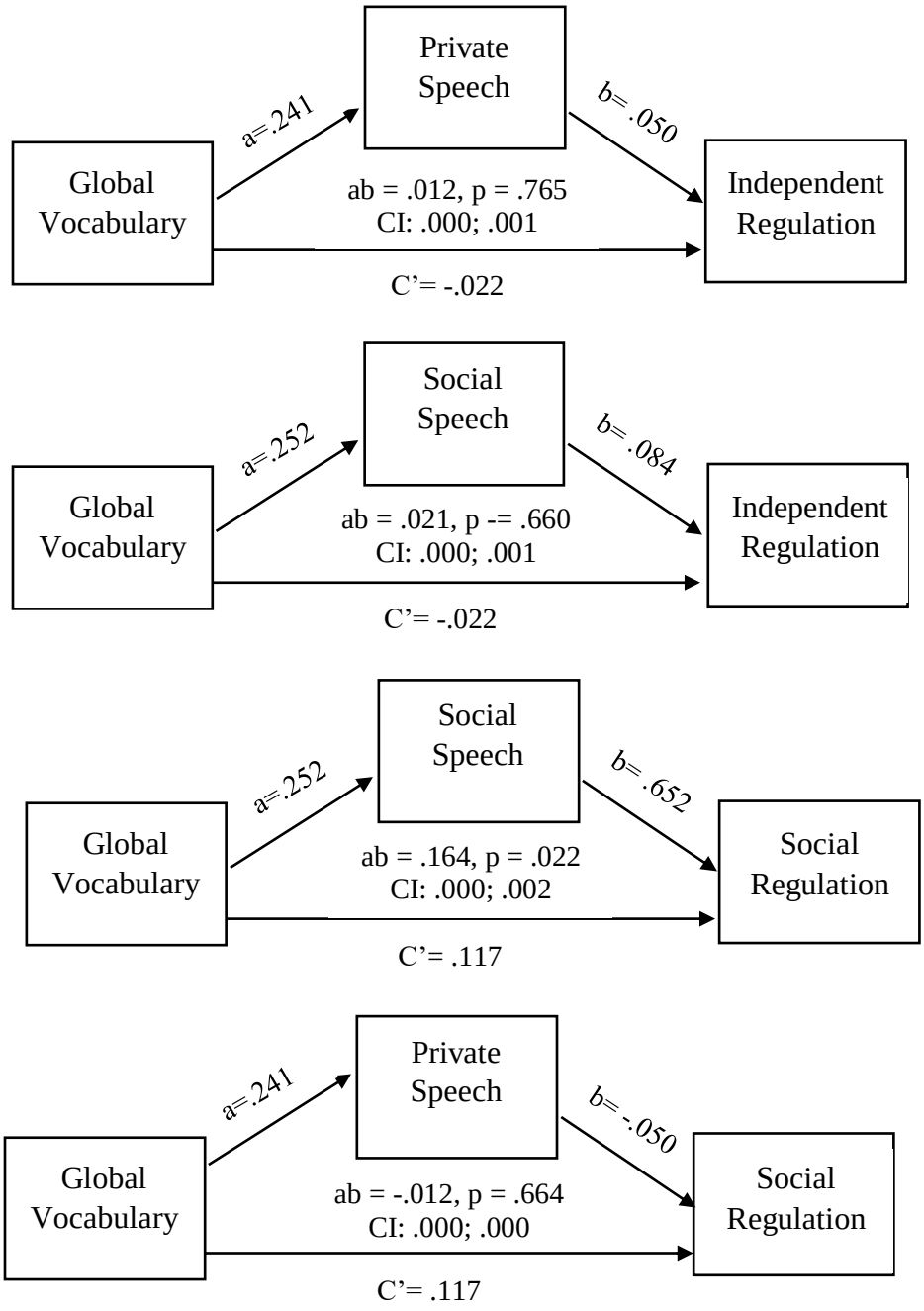


Figure 10. Indirect effects of Full Model 1 (collapsed across contexts)

Table 7

Measures of R^2 for dependent variables (saturated and pruned models)

	Model 1 (collapsed)		**Model 2 (Play)**		**Model 3 (Instruction)**	
Dependent Variables	Saturated	Pruned	Saturated	Pruned	Saturated	Pruned
Private Speech	0.06	0.06	0.02	0.02	0.09	0.09
Social Speech	0.06	0.06	0.08	0.08	0.02	NA
Independent Regulation	0.09	0.08	0.09	0.07	0.11	0.12
Social Regulation	0.47	0.46	0.42	0.45	0.31	0.29

Note. No R^2 value was obtained for social speech in the pruned Model 3 because the pathway from global vocabulary to social speech was pruned. As a result, social speech was not a dependent variable in this model.

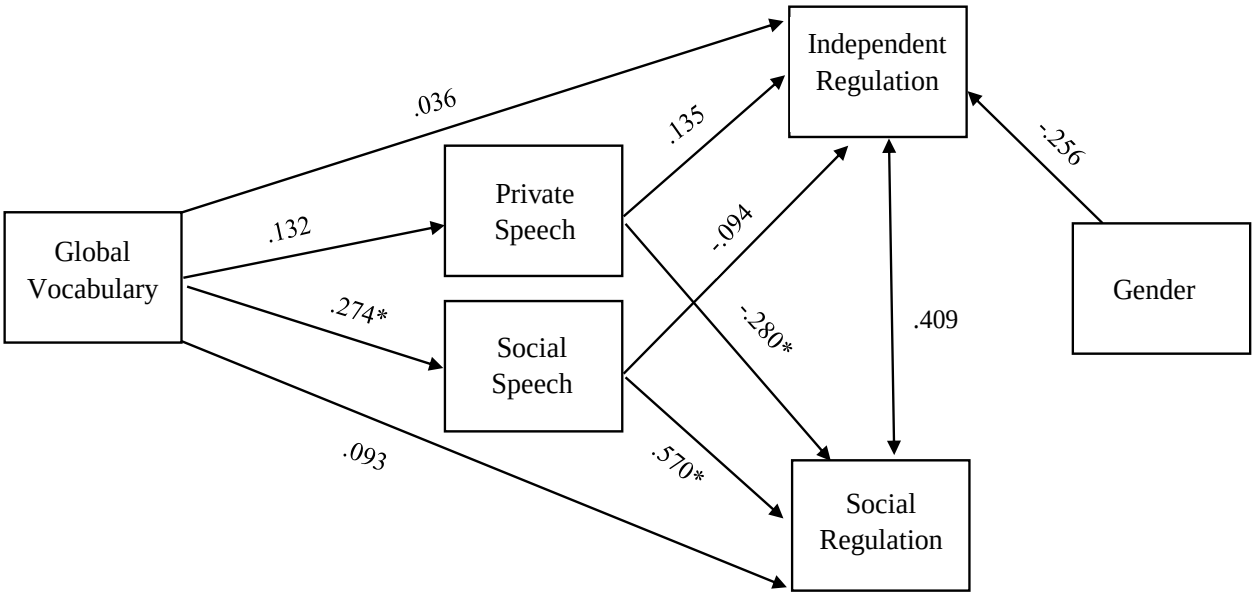


Figure 12. Path diagram of full/saturated Model 2 (play context)

$\chi^2(4) = 4.28$; RMSEA = .033, confidence intervals [.000, .025]; CFI = .995; TLI = .981; SRMR = .057

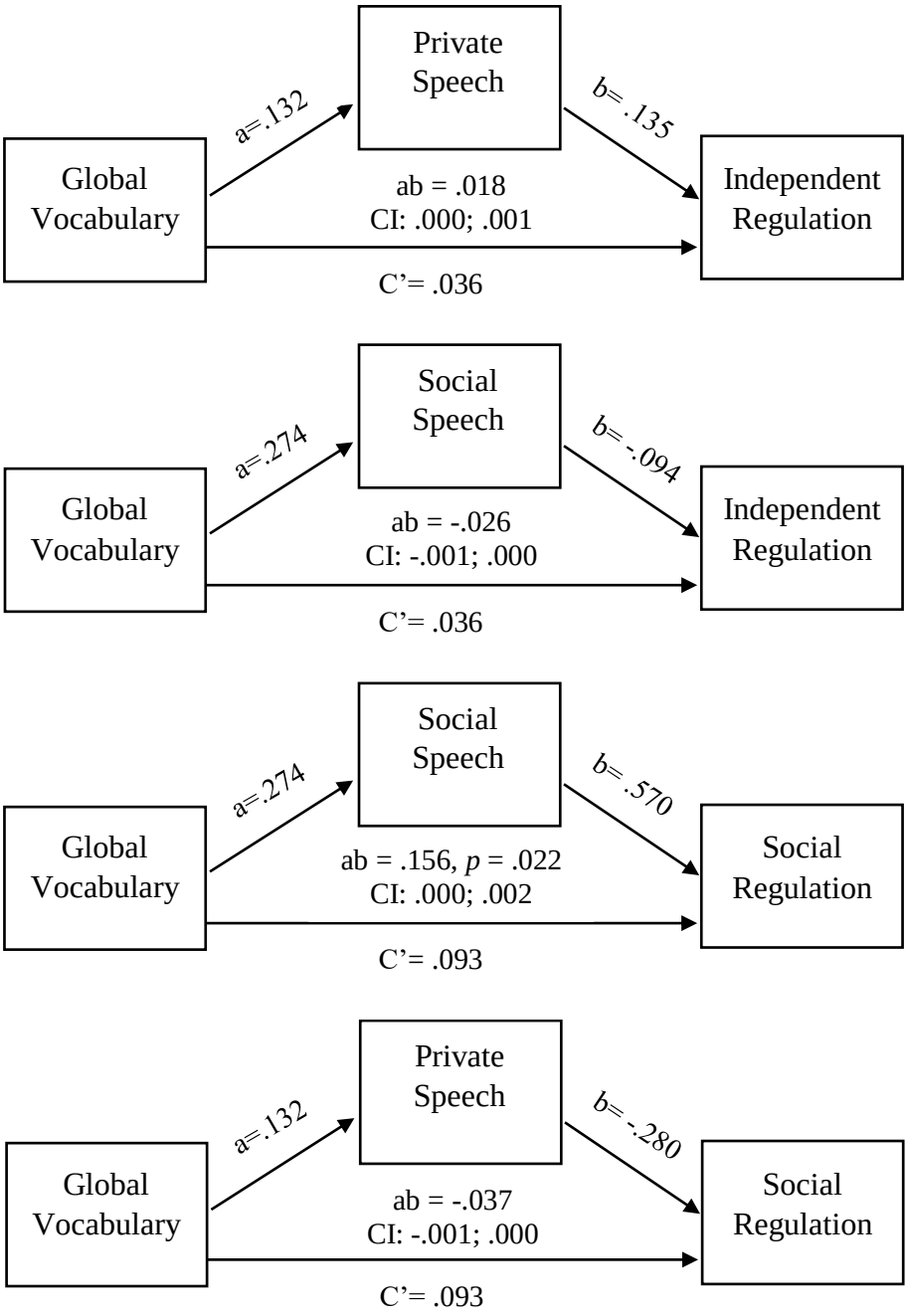


Figure 13. Indirect effects of saturated/full Model 2 (play context)

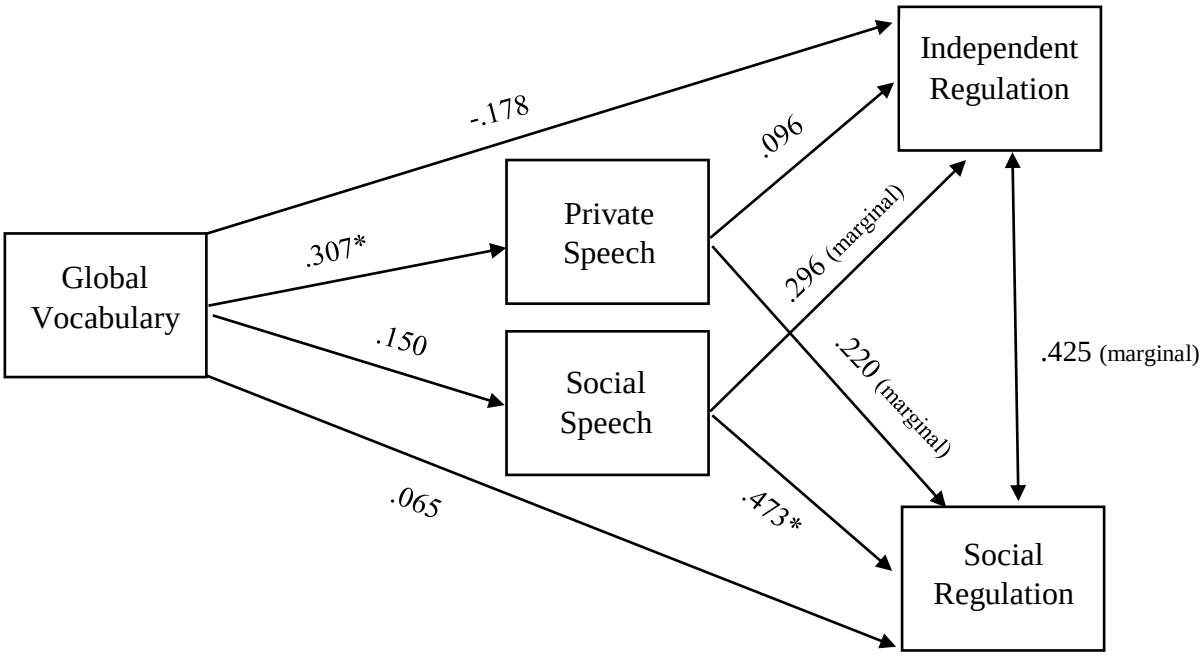


Figure 15. Path diagram of full/saturated Model 3 (instruction context)

$\chi^2(1) = 2.898$; RMSEA = .182, confidence intervals [.000, .443]; CFI = .954; TLI = .540; SRMR = .055

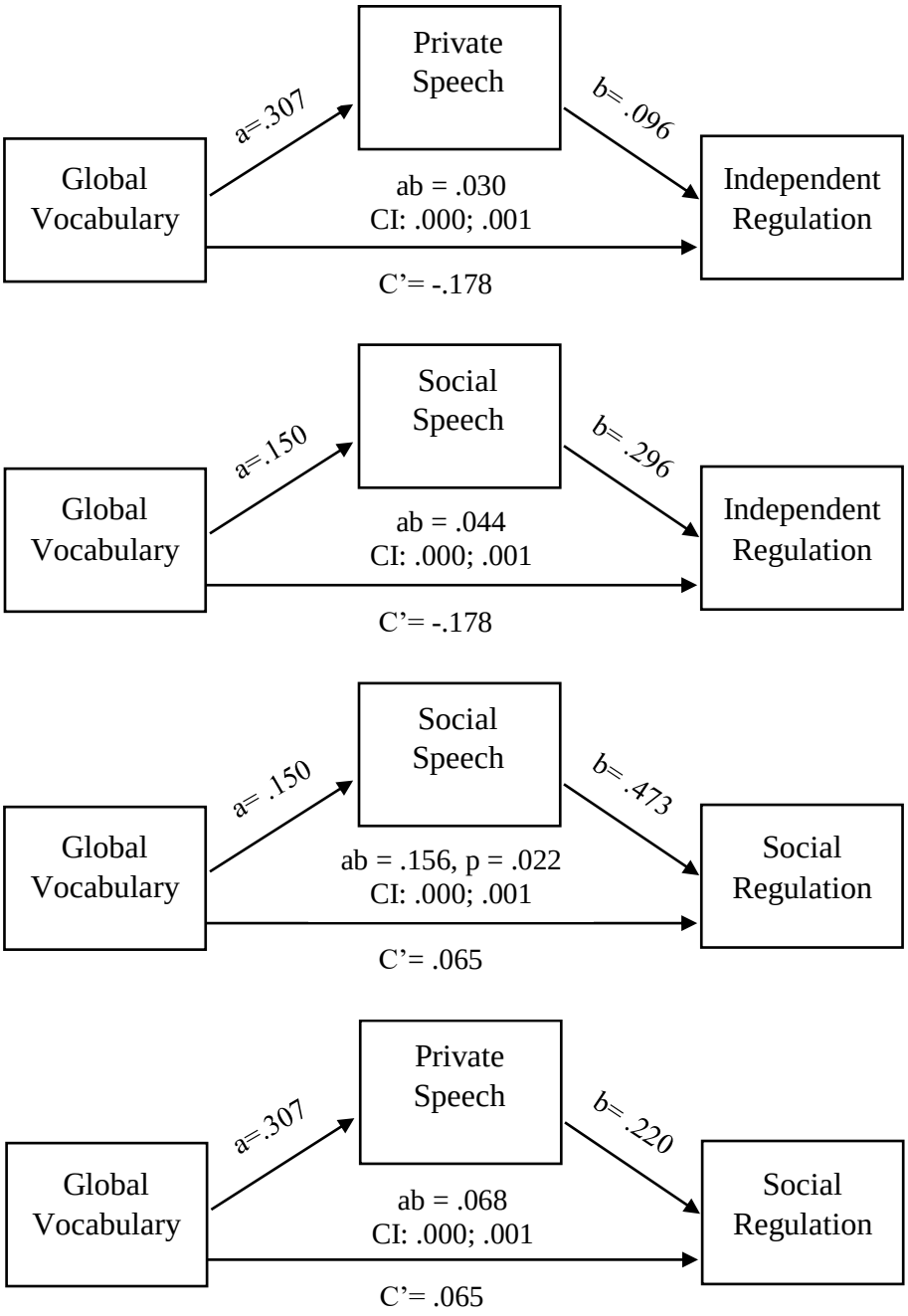


Figure 16. Indirect effects of saturated/full Model 3 (instruct context); no significant indirect effects

Vita

Lisa A. Connor earned her Bachelor's and Master's degrees in Psychology at Lehigh University. At the University of Tennessee, Ms. Connor will receive her Doctorate of Philosophy in Child and Family Studies. Ms. Connor's primary research focus is language development and self-regulated learning in low-income children, with a particular emphasis on the preschool classroom context.