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A Playful Context Enhances Bilingual and Monolingual Preschoolers’ Mastery Motivation and Private Speech

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A PLAYFUL CONTEXT ENHANCES BILINGUAL AND MONOLINGUAL
PRESCHOOLERS’ MASTERY MOTIVATION AND PRIVATE SPEECH

by

Jeremy E. Sawyer

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the
requirements for the degree of Doctor of Philosophy

The City University of New York

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This manuscript has been read and accepted for the Graduate Faculty in Psychology
in satisfaction of the dissertation requirement for the degree of
Doctor of Philosophy

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THE CITY UNIVERSITY OF NEW YORK
ABSTRACT

A Playful Context Enhances Bilingual and Monolingual Preschoolers’ Mastery Motivation and Private Speech

by

Jeremy E. Sawyer

Advisor: Anna Stetsenko

Children’s private speech (audible self-talk) has been studied primarily as a cognitive tool for thinking, planning and self-regulation. This study investigated whether private speech may also function as a tool for motivation. Vygotskian and self-determination theory suggest that children can develop to become agentic and inspired, or conversely disengaged and alienated, based largely on their social conditions of development. Thus, it is important to investigate children’s motivational processes in social and educational contexts that are central to child development. U.S. preschool enrollment is expanding, accompanied by a decline in play-based pedagogy and growth of didactic, teacher-centered approaches. To illuminate the effects of such trends, this study examined the relative impact of playful versus non-playful contexts on preschoolers’ private speech and mastery motivation. Mastery motivation involves ongoing attempts to master challenging activities, with components including performance, persistence, challenge seeking, and independence in problem solving. Approximately half the study’s participants were bilingual, and a recent review suggested that bilinguals may use more developmentally advanced private speech, or a wider variety of private speech functions than monolinguals (Sawyer, 2016). To explore
potential bilingual advantages in private speech, bilingual and monolingual participants were compared in terms of these qualities.

Study participants were 47 bilingual and monolingual preschool children ranging from 3 to 5 years of age. (38% White, 32% Asian American, 19% Latino, and 9% African American). Children were randomly assigned to engage in fishing and puzzle activities in one of two conditions (playful or non-playful) that simulated contrasting preschool contexts. The playful condition featured sociodramatic role-play, and encouraged intrinsic motivation and prosocial connection. The non-playful condition was framed as work production, emphasizing extrinsic rewards and individual performance assessment. Children’s private speech, mastery motivation, and relations between them were compared between conditions. Children’s private speech was classified as cognitive, metacognitive, motivational, imaginative, or partially internalized, using an analytic scheme that synthesized and integrated prior work on private speech.

Across both activities, children in the playful context displayed significantly higher mastery motivation than children in the non-playful context. Children in the playful context demonstrated better persistence and performance on the fishing activity, and greater challenge seeking and independence on the puzzle activity. Children in the playful context used more frequent total private speech, especially during the most challenging parts of each activity. Children in the playful condition used more frequent cognitive and imaginative private speech during the fishing activity, and more cognitive and metacognitive private speech on the puzzle activity. Children who used more imaginative private speech were more persistent, while children who used more cognitive private speech were more independent. Within the playful condition, bilinguals used more developmentally advanced (partially internalized) private speech, supporting the hypothesized bilingual advantage in developmental sophistication of private speech. In sum,
findings support the use of play and playful pedagogy for promoting bilingual and monolingual preschoolers’ motivational development, and motivationally beneficial private speech.

*Keywords:* private speech, mastery motivation, Vygotsky, sociocultural, sociodramatic play, preschool pedagogy, early childhood education, bilingualism, bilingual advantage, cognitive development, verbal mediation hypothesis.
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field. Susan Kirch of New York University helped me to think about how this work can best be translated to educational practitioners and popular outlets where it can influence teacher training and development. Adam Winsler of George Mason University shared his expertise in the methodology of private speech research, and continues to inspire my work in this fascinating field. Finally, Anna Stetsenko has been a fantastic advisor who has helped me to never lose sight of the overriding meaning of this work, and the role it aims to play in helping to transform education in progressive ways. Anna’s work on Lev Vygotsky’s revolutionary project and the transformative turn in cultural-historical activity theory was the reason that I decided to apply to the doctoral program at the CUNY Graduate Center, and remains my theoretical lodestar. Every conversation with her is lively, hilarious, and insightful, and I look forward to our continued collaboration.

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~Jeremy

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CHAPTER 1

Introduction

Work and play are words used to describe the same thing under differing conditions.

—Mark Twain, More Maxims of Mark, 1927

Private Speech as a Tool for Motivation

As children develop, they may become deeply engaged, or gradually alienated from educational and life activities. This suggests that the development of agency and motivation is a fundamentally developmental process. But how exactly do children develop motivation (or amotivation)? From what social and cultural sources do children construct their own agency? It is widely acknowledged that language is connected to thought, and plays an important role in children’s cognitive development. The potential relation between children’s language and motivation, however, is relatively uncharted. One particularly unique aspect of language development that may have implications for motivation is children’s private speech, or audible self-talk while engaged in activity. Private speech is often seen as a developmental precursor and contributor to inner speech, the stream-of-consciousness type of verbal thinking that appears to be ubiquitous and essential to adult human cognition (Wiley, 2016).

The intriguing phenomenon of children speaking to themselves aloud during daily activities can be readily observed in homes, schools, and on playgrounds. This private speech has been studied from a Vygotskian perspective primarily as a tool for cognition, including cognitive functions like thinking, planning, and self-regulation (for a review, see Winsler, 2009). These studies (Berk & Winsler, 1995; Wertsch & Stone, 1985; Winsler, Diaz, & Montero, 1997; Winsler & Naglieri, 2003) have generally supported Vygotsky's (1934/1986) argument that private speech derives from social speech used during social interaction, and gradually transforms into silent,
inner speech as children develop. This process of speech ‘internalization’ is held to be essential to the development of higher psychological processes such as verbal thought, metacognition, and self-regulation. Children’s use of private speech tends to peak during the preschool years, before becoming less frequent and partially internalized (e.g., expressed through clipped phrases or inaudible muttering) around age five or six (Winsler, 2009). This developmental trajectory means that the preschool period is an especially opportune and theoretically important period in which to study children’s private speech. Substantial empirical support for private speech as a tool for cognition has led to expanded consideration of its other potential functions. One question that has been broached recently, as reviewed by Atencio and Montero (2009), is whether private speech may also function as a tool for motivation, for instance by helping children to regulate their motivational processes and to develop and internalize stable motivational orientations.

To explore this question, Atencio and Montero (2009) explicated and elaborated the theoretical and empirical links between private speech and motivation. The core of their work builds on Vygotsky’s (1933/1967; 1934/1986) suggestion that children’s development of motivation, like cognition, has its origins in social and communicative activity, and is thus socially and verbally mediated. Studies in this promising area of investigation were pioneered by Montero and Huertas (1999), who found that children in naturalistic settings used moderate amounts of private speech that contained motivational content such as goals, expectancies, emotional reactions, and evaluations of themselves. Chiu and Alexander (2000) found a correlation between preschool children’s use of metacognitive private speech and their mastery motivation (which they defined as persistence in striving for goals). Building on this work, de Dios and Montero (2003) found that when children used more frequent motivational and cognitive private speech, their
persistence on moderately difficult tasks increased. While these early works were suggestive, they do not appear to have been followed up with further empirical investigation.

Because motivation, which has been defined as “the process whereby goal-directed behavior is energized and sustained” (Pintrich & Schunk, 2002, p. 49), is fundamental to all human activity, the nature of its potential link with private speech merits further exploration. Self-determination theory (SDT) posits that human beings can be agentic and inspired, or conversely disengaged and alienated, due in large measure to their social conditions of development (Ryan & Deci, 2000a). Research on such social conditions, and their associated sociocultural resources, has both theoretical and practical significance because it illuminates the causes of human behavior and informs the design of social environments that optimize the development of human potential and wellbeing (Ryan & Deci, 2000a). Therefore, it is necessary to investigate preschoolers’ private speech and motivational processes in specific social and motivational contexts that are central to their education and development. In particular, the distinct pedagogical approaches featured in early childhood education settings may play a powerful role in shaping preschoolers’ private speech and motivational processes.

**Play: Preschoolers’ Leading Activity**

To gain a more contextualized picture of how private speech and motivation may mutually influence each other, this study examined their relations in two experimental conditions that reflect common but divergent pedagogical styles in early childhood education. Traditional preschools, although they do not emphasize play to the extent that some Vygotskian programs do (e.g., *Tools of the Mind*, Bodrova & Leong, 2009), have chiefly been characterized by a play-based, child-centered approach. Vygotsky regarded sociodramatic play (i.e. children’s pretend role play within imaginary scenarios) as the most valuable - or “leading” - activity that contributes to preschoolers
Sociodramatic play is regarded by neo-Vygotskians as the activity through which preschool children learn best, and as a key resource for children’s development of motivation and agency (Karpov, 2005; Stetsenko & Ho, 2015). The Vygotskian emphasis on the distinctiveness of sociodramatic play highlights the idea that there are many forms of play, each with their own distinct qualities and developmental considerations. It further prompts the more basic question, “What is play?” Play has been defined in a myriad of ways within psychology, perhaps most broadly as any type of non-literal action that is done for enjoyment (Weisberg, 2015). While this definition has the benefit of simplicity, it is so broad as to include many things that don’t look like very much like the characteristic play in which preschoolers engage (e.g., mere enjoyable, non-literal thoughts would qualify under this definition). In contrast, the Vygotskian notion of sociodramatic play is far more specific, but is aimed at capturing the critical elements of preschoolers’ play that both constitute the play, as well as generate its profound developmental benefits. Vygotsky defined sociodramatic play as a relatively advanced form of play in which children (generally multiple children) create and enter imaginary scenario, and acting within that imaginary scenario according to implicit or explicit rules and roles that govern the motives, behavior, speech, and actions that take place within that imaginary situation (Vygotsky, 1933/1967). It stands to reason that these imaginary scenarios are generated from the child’s sociocultural experience and its creative transformation and recombination within their imaginations. The rules and social roles (characters) that children play within the imaginary scenario are likewise drawn from social and cultural life and artistic representations, and are reprocessed, modified, or transformed according to the children’s individual interests and collective negotiations as they engage in the play activity together. In contrast, other forms of play may involve simple physical manipulation of toys or objects (e.g., shaking a rattle), organized
sports, board games, or wrestling and general horseplay. These instances of play lack a central imaginary, pretend narrative or story that frames the activity, along with its accompanying roles and rules.

Because sociodramatic play challenges and demands so much of children, Vygotsky (1933/1967) famously asserted that play pushes children beyond the current boundaries of their development, creating a zone of proximal development in the process.

In play a child is always above his average age, above his daily behavior; in play, it is as though he were a head taller than himself. As in the focus of a magnifying glass, play contains all developmental tendencies in a condensed form; in play, it is as though the child were trying to jump above the level of his normal behavior. (p. 16)

Within cultural-historical activity theory, as developed by Vygotsky, Leontiev and others, a leading activity is not necessarily the most frequent activity in which children engage during any given period. Rather, the leading activity for a given age is the specific activity through which children’s most important social and psychological changes occur (Duncan & Tarulli, 2003). Leading activities vary historically and cross-culturally, but constitute the individual’s leading relation to their social environment. Leontiev (1981) identified a sequence of three leading activities in industrial society, depending on an individual’s social positioning: play, school, and work. For preschoolers, play is the activity that is the central source of novelty and generator of developmental change.

**Play and its Discontents**

Research since Vygotsky’s time has reported several benefits associated with play, including general enhancement of cognition, physical, social, and emotional development (Hurwitz, 2002). Within these broader areas are more specific claims of play facilitating creativity,
problem solving, intelligence, reasoning, social cognition, social skills, language, narrative skills, self-regulation (Lillard et al., 2013), and formation of ethical identities (Edmiston, 2010). Studies of play in the Vygotskian cultural-historical tradition have continued to expand investigation to completely immersive “playworlds” (Ferholt, 2010; Hakkarainen, 2004; Lindqvist, 1995; Rainio, 2010), and the fusion of literary narrative, creating writing, and dramatic play (Nicolopoulou et al., 2015; Nicolopoulou, McDowell, & Brockmeyer, 2006). In this spirit, researchers have called for creativity and play to become the central quality of all educational endeavors (Marjanovic-Shane, Connery, & John-Steiner, 2010).

Despite this tradition of support, play is being eradicated from preschool and early childhood program at a disturbing rate (Hirsh-Pasek, Golinkoff, Berk, & Singer, 2008; Miller & Almon, 2009; Nicolopoulou, 2010). Play-oriented programs have been discarded or dismissed as obsolete, in favor of teacher-directed instruction that employs the didactic, direct transmission of narrow academic skills. This trend toward the diminution of play has been especially severe for working class and low-income children (Nicolopoulou et al., 2006). At the same time, a significant reduction in arts-based programs has been documented, particularly among low-income and urban communities serving culturally and linguistically-diverse children (Ruppert, 2008). In a hostile educational climate of diminishing quality and quantity of play (Johnson, Christie & Wardle, 2005; Karpov, 2005; Russ & Dillon, 2011), the fundamental causal role of play in producing developmental benefits has been questioned, and the question thrown open as to whether play is responsible for generating any unique benefits at all (Lillard et al., 2013).

In place of play, an ever-growing, well-funded and corporate-backed education “reform” movement has stressed evaluation, outcomes, and accountability. This movement has propagated a more business-like, results-oriented approach to early childhood pedagogy that deemphasizes play
and discovery in education (Lasser & Fite, 2011). This has resulted in the historic reemergence of highly didactic, teacher-centered preschool programs, a form of pedagogy that was at one time characterized as “cognitive child labor” (Sutton-Smith, 1971, p. 13). Amid expanding U.S. preschool enrollment and expenditures, the question of the comparative merits of playful and didactic pedagogy for encouraging children’s development in general, and children’s motivational development in particular, takes on heightened importance. Empirical evidence that might speak to this question is limited, but two naturalistic studies suggest that child-centered, play-oriented programs may be more favorable for children’s motivational development than didactic, business-like programs (Stipek et al., 1998; Stipek, Feiler, Daniels, & Milburn, 1995). These studies compared children in these respective preschool programs on several different measures of motivation (e.g., expectations for success, challenge seeking, pride in accomplishments). Both during the preschool year and in subsequent longitudinal follow-ups, children in the teacher-centered environment showed greater motivation on most measures.

In sum, Vygotskian theory and a handful of empirical studies suggest that both play and private speech contribute to children’s development of motivation. Nevertheless, the differential impact of playful and non-playful, business-like contexts on preschoolers’ private speech and motivation remains unknown. The present study pursued this question by creating two distinct experimental contexts that intentionally simulated key characteristics of these conflicting pedagogical approaches. Within these opposing experimental conditions, children’s private speech, motivation, and the relations between them were examined to illuminate the ways in which preschoolers use private speech to mediate their motivational processes, and the impact of these contexts on children’s private speech and motivational processes.
The young children of New York City are highly linguistically diverse, and many of the preschoolers who participated in the study were bilingual. Bilingual development, and potential bilingual cognitive advantages, has become an increasingly important topic, both theoretically and in terms of educational and public policy. In order to further illuminate the potentially varied paths that the development of verbal mediation may take among linguistically diverse children, a subgroups analysis compared the private speech of bilingual and monolingual participants. A recent review of existing evidence suggested that the bilinguals may use more developmentally advanced private speech, or utilize a wider variety of private speech functions than monolinguals (Sawyer, 2016). These possibilities have theoretical relevance for attempts to account for reported bilingual cognitive advantages (Bialystok, 2017), and practical applications to bilingual education and U.S. educational policy for a growing bilingual population. Consequently, the developmental sophistication and diversity of functions for which bilingual participants used private speech was directly compared with that of monolingual participants. Chapter three will present the full theoretical rationale for investigating these potential bilingual advantages in the use of private speech during challenging activities.
CHAPTER 2

Motivation through Play and Private Speech

Agency and Volition in Play

Although many theorists have viewed motivation as originating in innate drives or inherent tendencies to explore and master the environment (Deci & Ryan, 2000; MacTurk & Morgan, 1995; White, 1959), Vygotsky saw the origin and development of motivation as a fundamentally social process, constructed through meaningful activities and relationships. Vygotskian theory maintains that sociodramatic play is a crucial social wellspring of preschoolers’ motivational development. Sociodramatic play crucially involves creating and entering an imaginary scenario, as well as creating and negotiating various rules that must be followed by the players (Vygotsky, 1933/1967). Objects are often symbolically transformed in play, such as when a block represents a car, or a stick becomes a living horse that can be ridden. Sociodramatic play also involves taking on pretend roles (e.g., astronaut, doctor), and playing these roles according to their social and cultural meanings (e.g., a child playing a mother rocks her baby doll gently to sleep). This process of assuming the role of a social other has sometimes been considered the central feature of preschoolers’ sociodramatic play (Elkonin, 2005). Children’s motivation to play, often assumed to be a biological need, has been interpreted by Vygotskians as a manifestation of children’s social desire to act like adults by taking on and trying out meaningful adult roles in play that they cannot undertake in ordinary life (Leontiev, 1981). Play enables children to actively appropriate and internalize the social roles, norms, cultural narratives, and organizational patterns of their society (Duncan & Tarulli, 2003). Children refract these roles and scripts through their own interests, and adapt, rework, or transform them for their own purposes. Children further develop agency through play by challenging, negotiating, and contesting existing social roles, as well as creating their own
playful worlds in which they exercise their developing agency (Stetsenko & Ho, 2015). When children play together in groups, and even alongside adults who may scaffold that play, children develop their individual and collective agency as play progresses, especially if play is allowed to unfold over several days or even longer periods (Rainio, 2010).

Although many theories of play have approached it exclusively from the perspective of children’s cognitive development, Vygotsky saw this as a problem. As he put it, “To refuse to approach the program of play from the standpoint of fulfillment of the child’s needs, his incentives to act, and his affective aspirations would result in a terrible intellectualization of play” (1933/1967, p. 6). Instead, Vygotsky emphasized that children’s motives for engaging in play and action in general are the crucial focal point. Vygotsky posited that play creates a zone of proximal development for motivation: “Action in the imaginative sphere, in an imaginary situation, the creation of voluntary intentions, and the formation of real-life plans and volitional motives – all appear in play and make it the highest level of preschool development” (1933/1967, p. 16). For Vygotsky, creation of imagined rules and meanings in play promotes the development of will, or voluntary activity independent of immediate reactions to physical stimuli. This type of committed, goal-directed action has been intimately linked with creative endeavors such as making art, creative writing, and play (Moran, 2010). Considering the vast creative motivation unleashed during play, children’s play can be seen as a process of creative “authoring” that is continuous with all creative human striving, developing, and becoming (Stetsenko & Ho, 2015).

Post-Vygotskian researchers have conducted a handful of experiments comparing children’s activity in play and non-play conditions that can be interpreted as relevant to motivation (summarized in Bodrova, Germeroth, & Leong, 2013). In one such study (Manuilenko, 1975), children in a non-play situation were asked to stand still as long as possible, while those in the play
situation were assigned the pretend role of a soldier guarding an important military object. Five-year old children were able to stand still much longer in the imaginary play situation than when merely told to stand still (this result was replicated decades later in Ivanova, 2000). In another study (Istomina, 1975), children remembered more words from a “grocery list” embedded in a dramatic play session involving a grocery store that when they were simply asked to memorize the same list. It seems likely that children’s enhanced persistence and performance in the play conditions is at least partly explained by increased motivation to enact pretend roles according to sociocultural meanings. On the other hand, play’s purported causal role and central importance in producing developmental benefits was recently challenged in a major review of several cognitive, social, and self-regulation outcomes (Lillard et al., 2013). This review reported little evidence for a unique causal role of play in generating developmental benefits in any area of cognition, social skills, or self-regulation. The review also strongly criticized research on the benefits of play for sloppy methods, including lack of control groups and well operationalized conditions.

Lillard et. al (2013) has been criticized on the grounds that included studies rarely featured mature sociodramatic play, the form of play held by Vygotskians to be most beneficial for preschoolers (Bodrova & Leong, 2013), and that some of the review’s conclusions were overly dismissive and inaccurate in their critique of the literature on play and narrative development (Nicolopoulou & Ilgaz, 2013). Sociodramatic play is a unique form of play that involves children creating and inhabiting an imaginary scenario, along with concomitant rules that must be followed and social roles that must be played by the participating children (Vygotsky, 1933/1967). In contrast, other forms of play may involve simple physical manipulation of blocks, toys, or objects without an imaginary, pretend narrative or story framing the activity. Similarly, physical play in the context of sports lacks the narrative richness and diversity of social roles found in
sociodramatic play. Likewise, the type of imaginary scenarios found in board games (e.g. chess, scrabble) are set by the game’s creators, and are generally rigid and fixed during the course of play, in sharp contrast to the fluid boundaries, roles, and rules that children repeatedly negotiate and renegotiate anew during the course of sociodramatic play.

Nevertheless, a point of agreement between Lillard et al. (2013) and those responding to her review, however, is that further research, and perhaps more methodologically rigorous research, is needed to deepen our knowledge of play’s developmental significance. One point of consideration is that the post-Vygotskian studies cited above conducted no inferential statistical analyses on the data derived from their experimental comparisons of playful and non-playful situations. Thus, while the authors could mention that the play conditions had higher means than the non-play conditions, for instance, the likelihood that such results were due to chance is unknown, and estimates of the size of play’s beneficial effects could not be derived. While perhaps justified in these cases and a more common approach to experimental data at the time, such an approach has the potential to undermine the credibility of these studies in certain circles of modern researchers. Statistical analysis aside, attention to methodological soundness is an acknowledged benefit in exploring the motivational and other effects of sociodramatic play. As a result, the present study aimed to contribute to research methodology on play, private speech, and motivation.

**Children’s Motivation for Mastery**

Although goal-directed, motivated activity has long been an important topic of psychological inquiry, there is a notable lack of research on motivation in young children (Stipek & Greene, 2001). This appears partly due to difficulties assessing motivation in this age group, in which typical self-report methods are less reliable (Berhenke, Miller, Brown, Seifer, & Dickstein, 2011). A useful construct specifying motivationally relevant, observable behaviors in children is
mastery motivation. Mastery motivation (Morgan, Harmon, & Maslin-Cole, 1990) involves children’s ongoing attempts to master challenging activities, regardless of immediate success, which in turn can spur new growth and development. Indicators of mastery motivation include performance, persistence, challenge seeking, and independence in problem solving during challenging activity (Berhenke et al., 2011). Mastery motivation measures have demonstrated reliability in preschoolers and other young children (MacTurk, Morgan, & Jennings, 1995), and have been found to predict readiness to learn (Wise, 2007) and long-term gains in cognitive, social, and executive functioning (EF) (Hauser-Cram, Warfield, Shonkoff, & Krauss, 2001).

Mastery motivation in preschoolers is closely related to the construct of mastery orientation in school-age children. Children with a mastery orientation have goals of increasing their capacities by learning and mastering new skills. Children with a performance orientation on the other hand, are concerned with eliciting rewards or positive judgments about their work (Dweck & Leggett, 1988). Mastery-oriented children persist when faced with failure, prefer challenging tasks, show higher levels of task enjoyment, and display positive attitudes toward learning (Elliot & Harackiewicz, 1996). Ample evidence has found mastery orientation to relate to achievement (for a summary see Turner, 2003). Although attention to social influences on mastery motivation has been largely limited to caregiver interactions (Morgan, MacTurk, & Hrncir, 1995), Vygotskian theory views such motivation as socially constructed through the entire range of children’s activity and development, including the potentially pivotal influence of preschool educational contexts, as well as children’s private speech, which the present study aimed to explore.

**The Two Souls of Preschool Pedagogy**
While moves toward universal preschool across the U.S. are expected to generate developmental benefits for young children, the relative advantages of distinct pedagogical approaches remain contested. Stipek, Daniels, Galuzzo and Milburn’s (1992) investigation of instructional styles and social contexts found that early childhood educational programs could be characterized as child-centered or didactic, based on the clustering of several factors. Child-centered programs were “play-like,” emphasizing social interaction, child initiative, enjoyment of learning, and embedding learning in meaningful activities. In contrast, didactic programs were “business-like,” emphasizing academic tasks, individual performance outcomes, extrinsic rewards, and external evaluation. Thus, in addition to pedagogical differences (emphasizing play vs. work production) the two settings also featured contrasting social atmospheres (related vs. individual) and motivational characteristics (intrinsic vs. extrinsic). In self-determination theory (SDT), intrinsic motivation refers to doing something because it is inherently interesting or enjoyable, while extrinsic motivation refers to doing something because it leads to a separable outcome or consequence (Ryan & Deci, 2000b). Play is often considered a prototypical example of an intrinsically motivated activity, and SDT predicts that intrinsically motivated children will in turn be more creative and playful that extrinsically motivated children. Stipek et al. (1992) pointed out that although there was no theoretical reason that pedagogical style needed to correspond to a certain motivational climate, these elements were strongly associated empirically, and tended to co-occur in naturalistic settings. Follow-up studies found that children in child-centered, play-like programs generally showed greater motivation both concurrently (Stipek et al., 1995) and longitudinally (Stipek et al., 1998) on a variety of measures (e.g., expectations for success, challenge seeking, pride in accomplishments) than children in didactic, business-like programs.

The present study simulated such pedagogical and motivational characteristics of play-like and
business-like contexts in order to closely examine and compare private speech and motivational processes within them.

Theoretically, self-determination theory’s (SDT’s) conception of intrinsic, autonomous motivation shares a kinship with children’s mastery orientation, while extrinsic, controlled motivation is linked with a less beneficial performance orientation. SDT stresses that conditions promoting autonomy (acting on intrinsic motivation) and relatedness (prosocial relationships) lead to greater psychological health and long-term persistence across a variety of domains (Deci & Ryan, 2008). In contrast to this autonomous motivation, conditions featuring external control and contingencies of reward or punishment promote controlled motivation (acting under pressure from extrinsic sources), which has been associated with negative psychological states, poor well-being, and a lack of motivated persistence (e.g., dropping out of high school; Vallerand, Fortier, & Guay, 1997). Although SDT research on motivation has been largely carried out with adults, the present study on mastery motivation and persistence in preschoolers can be seen as relevant to SDT theory, because the study’s two conditions simulate pedagogical and social contexts that promote either autonomous, intrinsic motivation (playful condition) or controlled, extrinsic motivation (non-playful condition).

**Does Play Promote Private Speech?**

Relatively little work has directly compared children’s private speech during play and non-play activity. Winsler and Diaz (1995) used classroom observations to compare kindergarteners’ private speech during a variety of goal-directed tasks (mostly academic) and various forms of play (e.g. physical play outside during recess, manipulatory play with blocks, fantasy play) in which children were engaged. Results indicated that children used more overall private speech during goal-directed tasks than during play. Similarly, Krafft and Berk (1998) conducted naturalistic
observation of children in a play-oriented preschool, as well as a non-play-oriented preschool during a variety of different activities. In seeming contradiction to the findings of Winsler and Diaz (1995) children in the play-based preschool were found to use twice as much overall private speech as children in the non-play-based school. Rather than goal-directed tasks promoting more private speech, as they did in the earlier study, Krafft and Berk (1998) found that open-ended, fantasy (sociodramatic) play activities across both schools elicited more self-guiding and “fantasy” private speech (self-directed role play verbalizations) than close-ended, non-play activities with clear end goals (e.g., table activities, puzzles, constructing models).

While there appears to be a discrepancy in the two studies above in terms of whether play or non-play, goal-directed tasks promote greater private speech, these seemingly contradictory results may be resolved by disentangling some relevant confounds. In both of these naturalistic studies, children were observed during a variety of activities, from academic goal-directed tasks to table activities, puzzles, and constructing models. As a result of this variety of activities, the difficulty level of the non-play activities naturally varied. The level of difficulty or challenge in an activity has been shown to affect the amount of private speech children use, with a moderate level of challenge (i.e., within the child’s zone of proximal development) enhancing children’s use of private speech (Winsler, 2009). Because the difficulty level of various activities was not controlled or equivalent from child to child, this is a potential confounding factor. In addition, the goal structure (open-ended vs. close-ended) of play and non-play activities were necessarily conflated with their pretend/non-pretend aspects. In other words, because the playful activities were generally open-ended, while non-playful tasks were close-ended, we cannot be sure which aspect (the structure or the playfulness) of the activities may have been responsible for encouraging increased private speech use among children. Finally, the earlier study (Winsler & Diaz, 1995)
incorporated a variety of play forms (physical, manipulatory, fantasy), while the later study (Krafft & Berk, 1998) reported on observation of sociodramatic play in particular. In sum, the combination of these factors is likely to play a role in their discrepant findings in regard to children’s amount of private speech in playful and non-playful contexts. The present study addressed these potential confounds through a design in which children engaged in the same two fishing and puzzle activities, which both featured a close-ended structure. Then this activity was framed in the context of sociodramatic play or performance-oriented work production, without changing the goals or the close-ended structure of the activities. In addition, child self-selection into various activities (as often occurs during typical preschool classroom activity) was removed. A further acknowledged limitation of Krafft and Berk’s (1998) study was the lack of random assignment of children to each preschool program (play-based or non-play-based), which allowed the possibility that unknown selection factors may have influenced private speech. The present study controls for this by randomly assigning children to playful and non-playful contexts, thus aiming to identify the relative causal impact of these contexts on private speech and motivation. Because children’s pretend play consists largely of enacted narratives (Nicolopoulou, 2006), we expected a substantial portion of children’s private speech in playful contexts to facilitate, enhance, and enact these dramatic narratives. Finally, the present study operationalized play on the model of sociodramatic play, as opposed to other forms of play (e.g., physical, manipulatory) that are considered less developmentally beneficial from a Vygotskian point of view (Bodrova & Leong, 2009; Karpov, 2005).

The Diverse Functions of Private Speech

The studies discussed previously have found three different private speech categories to be associated with motivation: cognitive, motivational, and metacognitive private speech. Each study
has conceptualized these categories slightly differently, however, which creates some confusion over which types or properties of private speech are most closely connected with motivation. In addition, it has been argued that much of the metacognitive private speech linked to mastery motivation in Chiu and Alexander (2000) is more appropriately regarded as motivational private speech (Atencio & Montero, 2009). In response, the present study seeks to operationalize these functional categories on a clear and consistent conceptual basis. In addition to these three functional categories above, a fourth functional category - imaginative private speech – was developed and added for its relevance to distinguishing children’s self-directed speech in playful, sociodramatic contexts and non-playful contexts.

Imaginative private speech in the present study is similar to the “fantasy” private speech coded in Krafft and Berk (1998), but is more broadly conceived than just role-play verbalizations, as will be detailed in the next section. Along with differentiating functional categories based on content, the present study also coded partially internalized private speech by its unique phonetic, semantic, or grammatical form (e.g., low volume, semantic condensation, or grammatical fragmentation). This developmentally advanced form of private speech signifies the growing internalization and transformation of social speech for purposes of inner speech and verbal thought. It is a strength that the widely-used coding system of Berk (1986) includes this developmental aspect, whereas the other coding schemes cited here did not. A seeming weakness of the Berk (1986) scheme, however, is its lack of attention to a range of potentially diverse private speech functions. For example, playful forms of private speech (e.g., word play and private speech addressed to imaginary others) have been classified as “task irrelevant” according to Berk’s scheme, implying that they are developmentally immature and play no useful role in task-oriented
behavior. In contrast, a key goal of the present study was to investigate the empirical relation between such imaginative private speech and the various components of mastery motivation.

**Private Speech and the Mediation of Agency**

Private speech can be understood as a tool that mediates between children’s motivational contexts and their individual motivated, agentic activity (Atencio & Montero, 2009). Research suggests that by using private speech, children often appropriate and enact social and cultural patterns embodied in their ongoing sociocultural interaction (for a review, see Winsler, 2009). In addition, children’s rates of private speech and the content it contains have often been found to be affected by the task on which children are working, or other contextual factors (e.g., Krafft & Berk, 1998; Winsler & Diaz, 1995). It stands to reason, then, that preschoolers’ private speech likely engages with and responds to motivationally relevant aspects of their social and pedagogical contexts. Thus, whether children’s private speech is playful and energizing, or negative and alienating may depend critically on the nature of their pedagogical milieus and activities. For better or worse, over time, such motivationally laden private speech likely facilitates children’s internalization of the predominant motivational patterns and orientations in their sociocultural surroundings.

From a Vygotskian perspective, as children internalize unique sets of motivational influences in the course of their social activity, unique individual differences in agency and patterns of verbal mediation are likely to be created. To the extent that private speech is not merely a window into children’s spontaneous moment-to-moment thought processes, but also represents the crystallization of a cohesive set of verbal mediation strategies, it would be expected that children would be relatively consistent in use of private speech from activity to activity. Thus, we might expect that children’s relative ranks in frequency or proportion of various private speech
categories would remain stable, even in the presence of contextual effects of different activities on their private speech. To date, however, there has been relatively little empirical investigation into whether individual differences in the frequency and types of motivational private speech that children use remain stable over time, or from activity to activity. While most Vygotskian research has focused on social and contextual effects on private speech, Winsler et al. (2003) undertook one of the few studies of both individual differences over time as well as private speech variance between tasks. The study’s tasks included a selective attention task that required children to determine the dimension (form or color) that was shared by two pictures, and a Lego-construction task in which children attempted to build a Lego structure that matched a visible three-dimensional model. Using these two tasks, Winsler et al. (2003) found a great deal of cross-task consistency in children’s relative ranks in frequency of overall private speech, frequency of most categories of private speech, and children’s frequency and proportions of partially internalized private speech. In total, 21 of 25 private speech categories (frequencies and proportions) showed significant correlations across activities (r’s from .39 to .73). In contrast, relatively little task-specificity was found in children’s private speech, as only five of 25 private speech categories showed a significant change in means from one task to the next, though children’s mean frequency of total private speech did differ across tasks. The present study aimed to further contribute to our understanding of children’s consistency in verbally mediating their motivation across activities, as well as to investigate the particular forms and functions of private speech that may be elicited by different activities. While some consistency in private speech patterns across tasks was expected, it was also anticipated that children would strategically adapt their use of private speech functions to the motivational and mastery challenges of the activity at hand.
In a potentially useful distinction, Wolters (2003) distinguished motivation itself from the active regulation of motivation, based on the awareness and purposefulness of motivational thoughts and actions. In this framework, private speech with motivational content may indicate an embryonic, developing consciousness of motivational processes, and an attempt to verbally self-regulate these processes. Due to this dawning awareness, children in a demotivating context may attempt to compensate (successfully or unsuccessfully) for their resulting lower levels of motivation by increasing their use of motivational private speech. This prospect is borne out in Atencio (2003), where children used more frequent motivational private speech when they appeared to lack inner motivational resources. Conversely, Thibodeaux (2016) found that young tennis players reported positive self-talk was related to a strong mastery orientation. These conflicting findings indicate that further clarification is needed in regard to the relation between motivational private speech and motivation itself.

Furthermore, it is possible that children in highly motivating contexts may use private speech to amplify those motivating qualities. This may have occurred in the study by Krafft and Berk (1998), when children used more fantasy private speech during highly engaged sociodramatic play. In the present study, if children used motivational private speech to unsuccessfully compensate for lower motivation, one would expect to see a negative relation between mastery motivation and motivational private speech. Conversely, if children used private speech to appropriate and playfully augment the motivating imaginary scenarios involved in the playful context, a positive relation between mastery motivation and imaginative private speech and/or motivational private speech would be anticipated.
CHAPTER 3

Private Speech as a Window onto Bilingual Development

Bilingualism and Cognitive Development

Considerable research during the past century has examined the cognitive correlates of learning more than one language. Among the world’s population, monolingualism is actually the exception rather than the norm (Tucker, 2003), and in the United States, 21% of people over age five speak a language other than English at home. This number continues to grow (Ryan, 2013), making bilingual development an increasingly important topic, both theoretically and in terms of educational and public policy.

Bilingualism has long been a politically and socially contentious matter. Historically, bilinguals have often been viewed with suspicion in Europe, England, and the United States (where they were often immigrants), and the impact of multiple languages on development was viewed negatively. For instance, Epstein (1915) argued that bilingualism slowed down thought processes and constituted a general “social ill,” while Jespersen (1922/2013) saw bilingualism as diluting children’s command of each language, and inevitably leading to “inner conflict.” In an article titled “Multilingualism in Children,” Vygotsky (1935/1975) critiqued such works, contrasting them with case studies finding positive benefits to bilingual development (Pavlovitch, 1920; Ronjat, 1913). Vygotsky recommended undertaking an extensive program of empirical study of multilingualism and thought, without reliance on standardized testing or the assumptions of bilinguals’ inferiority common to Western research. Vygotsky’s sensitivity to the oppression suffered by many bilingual immigrants was of a piece with his Marxist political views, and his belief in the fundamental equality of all people (Sawyer, 2014; Stetsenko & Arievitch, 2014). As fate would have it, Vygotsky’s program was never initiated, as multilingual education had already
been embraced in the Soviet Union, and literacy campaigns and rebuilding society were more pressing priorities (Pavlenko, 2014). Considering Vygotsky’s oeuvre, however, it seems likely that the investigation of private speech would have figured prominently in his proposed research program on bilingualism and cognition.

Three decades later, a study in which bilingual Canadians outperformed monolinguals on a variety of verbal and nonverbal measures (Peal & Lambert, 1962) became a major turning point in research on bilingual development. Peal and Lambert proposed that “balanced bilingual” children (possessing equal experience and proficiency in each language) demonstrated enhanced cognitive flexibility in working with symbols and forming concepts (Barac, Bialystok, Castro, & Sanchez, 2014). This accelerated research into the positive benefits of bilingualism, and research since this time has followed two basic methodological paradigms. The first method (that of Peal & Lambert, 1962) compares the cognition of relatively balanced bilinguals to that of monolinguals. The second approach (dubbed the “within bilingual” design by Hakuta & Diaz, 1985) compares children who vary in their degree of bilingualism (e.g., balanced, partial, and limited bilinguals) to examine how relative bilingual proficiency relates to various cognitive measures.

This lineage of research has established what has become known as the “bilingual advantage” in two general domains (Bialystok & Barac, 2012). First, bilinguals appear to show enhanced metalinguistic awareness, which allows children to understand the underlying structure of language and includes skills in deciphering language patterns and controlling attention to various linguistic features (e.g., sentence form or meaning). This allows bilinguals, for instance, to selectively attend to one aspect of language (e.g., grammar) while ignoring another (e.g., meaning). Interestingly, this metalinguistic advantage was predicted by Vygotsky (1934/1986) on the basis that, through understanding one language system in relation to other systems, bilingual
children would develop a special awareness and control over linguistic symbols and operations. Bilingualism has also been associated with improved nonverbal executive functioning (EF), or executive control. EF has been defined in various ways, but broadly refers to the “set of cognitive processes that underlie flexible goal-directed responses to novel or difficult situations” (Hughes & Graham, 2002, p. 131). In the literature, EF most often includes inhibition of irrelevant information or responses, holding and manipulating information in working memory, and cognitive flexibility in switching goals or tasks (Barac et al., 2014; Miyake et al. 2000). In studies of potential bilingual advantages, inhibition, monitoring, and task-switching have been the most frequently investigated EF components.

A meta-analysis on the cognitive correlates of balanced bilingualism (Adesope, Lavin, Thompson, & Ungerleider, 2010) found an even wider array of bilingual advantages among bilinguals with nearly equal proficiency in both languages, including metacognitive awareness, symbolic representation, and problem solving. Evidence suggests that these bilingual advantages may be enhanced by an early age of bilingual acquisition, regular social use of the two languages, and average or better proficiency in each language (i.e. balanced bilingualism) (Yow & Li, 2015). A critical review (Barac et al., 2014) focusing on preschoolers who were dual-language learners (with widely-varying proficiency in each language) found bilingual advantages in executive control and theory of mind, and some areas of metalinguistic awareness. Further bolstering the argument for bilingual cognitive uniqueness, Barac et al. (2014) reviewed 10 studies showing consistent evidence that building up linguistic knowledge in two languages induced functional brain changes in children. Finally, increased grey matter density in the left inferior parietal area (recruited for various executive functions) was found to correlate with bilinguals’ L2 proficiency and age of bilingual onset (Luk, De Sa, & Bialystok, 2011).
The bilingual advantage in its various forms has recently been questioned on the grounds of purported publication bias (de Bruin, Treccani, & Della Sala, 2015) and some studies finding no advantage in certain executive function tasks (Paap & Greenberg, 2013). It has been pointed out, however, that assertions of bias are based upon consideration of conference abstracts rather than papers actually submitted to journals, thus making it difficult to draw conclusions about de facto potential publication bias (Bialystok, Kroll, Green, MacWhinney, & Craik, 2015). Furthermore, the conference abstracts under consideration rarely show a bilingual disadvantage, which would be expected in numbers equal to studies showing positive effects if the bilingual advantage did not exist (Bialystok et al., 2015). Although still controversial, when taken on the whole, extant literature suggests that an early age of acquisition (Luk et al., 2011), frequent use of each language, and greater “balance” and proficiency in both languages correspond to greater advantages (Bialystok, Craik, & Luk, 2012).

**What Can Explain Bilingual Cognitive Advantages?**

A variety of theories have been proposed to explain the mechanisms responsible for apparent bilingual advantages. While Vygotsky (1934/1986) and Leopold’s (1949) explanations for metalinguistic benefits have been largely accepted, mounting evidence for bilingual advantages in nonverbal skills like EF seemed to necessitate additional theoretical work. Peal and Lambert (1962) proposed an account based on enhanced cognitive flexibility, owing to bilingual children’s experience with two linguistic symbols standing for every one thing in the world, and regular switching between the two language systems (the code-switching hypothesis). Recent accounts include models built around enhanced control of processing (Bialystok, 1986; 1993), inhibitory control (Green, 1998) and conflict monitoring (Hilchey & Klein, 2011) of representations in two simultaneously activated languages. Kroll and Bialystok (2013) argue that the diversity of reported
bilingual advantages cannot be reduced “to a few measurable components” (p. 501) but involves the complex reconfiguration of cognitive networks. Crucially, they emphasize that what is still poorly understood is how a linguistic experience like bilingualism might lead to a change in nonverbal cognitive processing.

While most explanations for bilingual advantages stem from an information-processing framework, Diaz and Klingler (1991) outlined a potential explanation based in Vygotskian theory about the developmental relations between thought and language. Vygotskian theory, in addition to its empirical support from private speech research with monolinguals, appears to be uniquely positioned to explain bilingual advantages because it postulates that acquiring and internalizing language plays a crucial role in the development of higher mental functions, and promotes a radical transformation of cognitive development. Based on these considerations, Diaz and Klingler proposed that engaging in social communication using two language systems from an early age allows children to build a heightened metalinguistic awareness not only of the objective formal rules and structures of language, but also of language functions. Just as bilinguals’ awareness of grammaticality leads to greater control over grammatical production, this enriched awareness of the cognitive functions of language leads to increased use of language as a tool of thought and self-regulation. In turn, this more flexible, extensive, and effective use of verbal mediation confers advantages in cognitive performance across both verbal and nonverbal tasks related to EF. The authors dubbed this unified explanation for observed bilingual advantages the **verbal mediation hypothesis**. Instead of postulating a potpourri of cognitive mechanisms (e.g., inhibition, selection, conflict monitoring, switching) to explain bilingual advantages, each often corresponding to measurement by a different test (e.g., Flanker, Simon, Stroop, and Dimensional Change Card Sort tests), a unified explanation has the benefit of parsimony and conceptual clarity. Considering
current difficulties in explaining how bilingual experience could generate enhanced nonverbal cognition, the verbal mediation hypothesis appears to merit exploration as a theoretical account.

Research conducted since the verbal mediation hypothesis was proposed adds weight to the hypothesized connection between language and EF. Correlational studies suggest that receptive verbal ability is related to flexibility, working memory, and planning, and that verbal ability mediates success on EF tasks (for a review see Müller, Jacques, Brocki, & Zelazo, 2009). Evidence suggesting that increased private speech by children with ADHD may be an attempt to gain control over impulsive behavior (Winsler, 2009) supports the notion that verbal mediation, especially in its partially internalized form, can enhance executive control. Partially internalized private speech in particular has been linked to enhanced performance on various EF tasks (Alarcón-Rubio, Sánchez-Medina, & Prieto-García, 2014; Al-Namlah et al., 2006; Fernyhough & Fradley, 2005). Finally, in their review of the relations between language (including private speech) and executive functioning, Muller et al. (2009) concluded that “correlational and experimental studies suggest that language is related to and probably necessary for the development of higher levels of EF” (p. 65). If language use in general and private speech in particular are related to EF, the suggestion that unique forms of verbal mediation among bilinguals play a role in nonverbal EF advantages seems quite plausible. Furthermore, monolingual research suggests that children with more language experience are more consciously aware of their private speech and more likely to use it effectively (Manfra & Winsler, 2006; Winsler & Naglieri, 2003). Thus, it is possible that bilinguals’ rich use of different language systems in a variety of contexts develops their awareness that speech, originally social, can also be used to communicate with themselves for a variety of purposes.
**Bilingual Advantages in Private Speech?**

Given the importance of private speech as a developmental phenomenon, along with ongoing research suggesting cognitive advantages associated with bilingual development, examining the private speech of bilinguals may provide insight into the developmental process by which such cognitive advantages are formed. Taken as a research framework, the verbal mediation hypothesis raises the intriguing question as to whether there are any observable differences or advantages in bilinguals’ private speech. The private speech of bilinguals may reveal developmental patterns or advantages unseen in the private speech of monolinguals, thus offering a unique window onto emerging advantages in verbal mediation. In addition, bilingual private speech may further illuminate the diversity and richness of possible trajectories of private speech development.

There has been little research on potential bilingual advantages in the use of private speech, and to date the results are mixed. Amodeo and Cardenas (1983) found that bilingual preschoolers used an equivalent number of private speech categories as monolinguals, and Centeno-Cortes and Jiménez Jiménez (2004) found that bilingual adults with varying levels of L2 proficiency used equivalent types of private speech functions. In contrast, three studies of young children and adults (Diaz, Padilla, & Weathersby, 1991; Jiménez Jiménez, 2015; Klingler, 1986) found that relatively balanced bilingualism was associated with two private speech differences in comparison to less-balanced bilinguals: more developmentally advanced private speech, and a wider variety of private speech functions. In the context of verbal mediation hypothesis, more developmentally advanced (i.e. partially internalized) private speech, or greater flexibility in using a wider variety of private speech functions among bilinguals may indicate nascent bilingual advantages in the verbal mediation of cognition.
Bilingual versus Monolingual Subgroups Analysis

A major limitation of almost all existing private speech studies relevant to potential bilingual advantages is that they compare bilinguals of varying levels of proficiency with other bilinguals, rather than directly comparing bilinguals and monolinguals. Although within-bilingual designs have been useful in identifying potential private speech advantages among balanced bilinguals, this methodology needs to be supplemented with direct comparisons of monolinguals and bilinguals that could more clearly illuminate the unique properties of bilingual verbal mediation. To address this need, a subgroups analysis within the present study analyzed the private speech of bilingual participants in relation to that of monolinguals.

The young children of New York City are highly linguistically diverse, with over 41% of students in New York City public schools speaking a language other than English at home (NYC DOE, 2013). As a reflection of this linguistic diversity, this study enrolled approximately equal numbers of bilingual and monolingual participants, which facilitated investigation of the impact of linguistic diversity on private speech. A summary of preliminary evidence suggests that the bilinguals may use more developmentally advanced private speech, or utilize a wider variety of private speech functions than monolinguals (Sawyer, 2016). Thus, the developmental sophistication and diversity of functions for which bilingual participants used private speech was directly compared with that of monolingual participants. The possibility of private speech has theoretical relevance for the verbal mediation hypothesis as an account for reported bilingual cognitive advantages, and practical importance for applications to bilingual education and policy regarding the education and development of the growing U.S. bilingual population.
CHAPTER 4

Research Questions and Hypotheses

The present study created two experimental conditions corresponding to the prevailing types of preschool settings identified in Stipek et al. (1992). These playful and non-playful (business-like) contexts were created by framing a fishing activity and a puzzle activity as either sociodramatic play or work production. Motivational features associated with each preschool setting were also added to the respective contexts. Preschoolers’ mastery motivation and private speech were examined within and across contexts to address the following questions: (1a) Do children demonstrate stable individual differences in mastery motivation and private speech use across challenging activities? (1b) Relatedly, do children employ different categories of private speech to mediate their motivation on specific activities? (2) What is the relative impact of playful and non-playful contexts on preschoolers’ mastery motivation? (3) What is the relative impact of playful and non-playful conditions on preschoolers’ overall frequency of private speech? (4) What is the relative impact of playful versus non-playful conditions on children’s use of various private speech categories, as well as the emotional valence of their motivational private speech? (5) How does children’s use of private speech relate to their mastery motivation and its individual components (performance, persistence, challenge seeking, and independence)? (6) Finally, do bilingual children show any advantages over monolinguals in the developmental sophistication or diversity of functions for which they use private speech? If so, are these advantages apparent in both playful and non-playful conditions?

Based on the literature reviewed above, it was hypothesized that (1a) children would demonstrate stable individual differences in most overall private speech frequencies and functions across activities. Simultaneously, however, children were expected to (1b) employ the private
speech functions that were most useful for the particular activity in which they were engaging (e.g., cognitive private speech on puzzles, imaginative private speech on fishing). In regard to the relative impact of playful and non-playful conditions, it was anticipated that (2) children in the playful context would show higher mastery motivation and (3) use more frequent overall private speech than children in the non-playful context. It was further expected that (4) children in the playful context would appropriate and internalize the playful, agentic qualities of their context by using more frequent imaginative private speech, and higher proportions of imaginative private speech. Given conflicting prior evidence related to motivational private speech, it was deemed uncertain whether children would use more of this speech in the playful or non-playful context. In addition, it was expected that children in the playful condition would show a more positive valence in their motivational private speech than children in the non-playful condition.

Regarding the relation between private speech and motivation, it was predicted that (5) children’s mastery motivation would relate to their use of motivational private speech, although for similar reasons it was unclear whether this relation would be positive or negative. Given the posited motivating qualities of play, children’s mastery motivation was also expected to relate positively to their use of imaginative private speech. It was further speculated that various private speech categories would show strong relations to particular mastery motivation components (e.g., performance, persistence, challenge seeking, independence). In other words, the study aimed to explore which forms of private speech related most strongly to each component of mastery motivation. With regard to the linguistic subgroups analysis, it was hypothesized that (6) bilingual children would show greater developmental sophistication and functional diversity in their private speech than monolingual children in both conditions. Finally, as a minor point, based on Vygotskian theory about the progressive developmental internalization of speech, it was expected
that older children would use more developmentally advanced (partially internalized) private speech than younger children.
CHAPTER 5

Method

Participants

Participants included 47 preschool children (31 boys, 16 girls) attending three different preschools (one in a public K-12 school, and two affiliated with a large public university system) in a large city in the northeastern United States. Based on a power analysis of previous studies that addressed private speech in the context of play and motivation, a sample size of 40 participants was set as the recruitment goal. After this goal was attained, recruitment continued to further strengthen power until 47 participants were reached, at which time recruitment was stopped due to logistical reasons involving the timing of dissertation completion.

Ages of participants ranged from 3 to 5 years of age (43 to 65 months, $M = 55.2$, $SD = 5.9$). As a group, participants’ ethnicities were 38% White, 32% Asian American, 19% Latino, and 9% Black/African American. Participants were randomly assigned to engage in a fishing activity in one of two conditions (playful or non-playful). Participants from each preschool site were randomized into the two conditions such that every site had equal numbers of preschoolers in each condition. Means for relevant demographic variables for each condition are displayed in Table 1. There were no significant differences in age, gender composition, or bilingual status between conditions.

Table 1

Means (and standard deviations) for participant characteristics by condition

<table>
<thead>
<tr>
<th>Variable</th>
<th>Playful</th>
<th>Non-Playful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant N</td>
<td>24</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Females</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Bilinguals</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>Age (in months)</td>
<td>54.3 (5.9)</td>
<td>56.2 (5.9)</td>
</tr>
</tbody>
</table>

**Description of Preschool Sites**

All three urban preschool sites from which participants were recruited housed children that were culturally, ethnically, and linguistically diverse. The preschool classrooms in the public K-12 school from which children were drawn contained a mixture of working-class and middle-class children. One of the university-affiliated preschools was a community college, and the majority of children were working class and relatively lower SES. The other university-affiliated preschool contained a mixture of working-class and middle-class children, with a relatively higher SES. Classrooms within the public K-12 preschool varied in their teaching philosophies. In some of these classrooms, relatively more emphasis was placed on sociodramatic play and other child-centered activities conducted during “centers” that were freely chosen by children. In other classrooms, the emphasis was primarily on pre-academic work to prepare children for the academic demands of kindergarten, with children’s activity primarily directed by the teachers. Within the community-college affiliated preschool, the emphasis among various classrooms was chiefly on child-centered activities conducted during “centers” that were freely chosen by children, and which included sociodramatic play as one of the centers. The other university-affiliated preschool mainly featured child-centered, playful activities and sociodramatic play conducted within various classroom centers. As a point of comparison, while play was featured to some degree within all of the preschool sites, none of them made sociodramatic play the dominant
centerpiece of classroom activity and curriculum, for instance in the way that the *Tools of the Mind* (Bodrova & Leong, 2009) program does.

**Participants’ Bilingual Status**

To assess children’s language background, parents answered a set of questions adapted from the New York City Department of Education Parent/Guardian Home Language Identification Survey (HLIS) (see Appendix). These questions collected information about children’s language background at home and school; children’s proficiency in understanding, speaking, reading, and writing specific languages; and children’s patterns of language use with parents, siblings, and other relatives and caregivers. If parents indicated that the child understands, speaks, reads, writes, or primarily interacts in a language at home or school, then the child was considered to speak that language (whether English or a language other than English). If only English was indicated on all of these survey questions, the child was considered monolingual. If the survey indicated that a child spoke a language in addition to English, that child was considered bilingual for the purposes of this study. Based on this survey, 26 (55%) of participants were classified as bilingual, and 21 (45%) as monolingual. All of the bilingual preschoolers were reported to also understand and speak English. Bilinguals’ reported home languages other than English included Chinese (Mandarin and Cantonese), Spanish, Russian, Korean, Burmese, Dutch, Hindi, French, German, Hebrew, Italian, and Polish. Bilingual participants did not differ significantly from monolinguals in demographic variables such as age or gender composition, and each preschool site had approximately equal numbers of bilinguals and monolinguals.

**Materials**

The fishing activity required the use of a toy fishing rod with a magnetized lure to catch magnetized plastic fish from a “pond,” an area defined by a hula hoop placed on a rug. Children
placed fish that they caught in a toy fishing bucket. During a pilot phase of the study, materials were tested out with a handful of preschoolers of varying ages. The idea was to assess the difficulty of the fishing and puzzle activities, as well as to assure that children were using some private speech during the activities. After piloting, in order to adjust for children’s age-related capacities, 3- and 4-year-olds were given 5 fish to attempt to catch, while 5-year-olds were given 6 fish, which took them roughly equal amounts of time to catch. Based on piloting, some fish were relatively easy to catch, and others moderately challenging, but catchable with some persistence. One fish, however, was impossible to catch due to its peculiar weight distribution. Importantly, the impossible fish gave the impression of being catchable, as it partially attaches to the magnetized lure before inevitably sliding off the lure upon being lifted. The use of this insoluble task allowed measurement of children’s time of persistence in attempting to catch the impossible fish, which was used as one indicator of mastery motivation. Insoluble tasks help to deconfound performance and persistence, which has been an issue in past studies, wherein high-performing children scored lower on a persistence measure merely because they solved the task quickly (McCall, 1995). The puzzle activity involved three 12-piece puzzles that contained images of barnyard animals, and one 24-piece puzzle that contained images of zoo animals. Based on piloting, the barnyard puzzles were moderately challenging for children of preschool age, while the zoo puzzle was more challenging, but could typically be completed with persistence. Additional materials included two different sets of family figurines. Each set included three figures: a father, mother, and child. These family figurines were used during the playful conditions for both fishing and puzzle activities, as detailed below.

Procedure
Children engaged in the fishing and puzzle activities individually in a separate but familiar room of their preschool, in order to avoid interruptions and to regulate the social and environmental context for the experiment. All children engaged in the fishing activity first, followed by the puzzle activity. Children were audio/video recorded during the activities, in order to later accurately analyze their private speech and motivation-related behaviors. The study employed a between-subjects design, with children randomly assigned to engage in both activities (fishing and puzzles) in the same condition (playful or non-playful). The following are descriptions and samples of the scripts for each activity. Key characteristics of each condition are displayed in Table 2.

<table>
<thead>
<tr>
<th>Framing</th>
<th>Playful Condition</th>
<th>Non-Playful Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivational emphasis</td>
<td>Pretend role play</td>
<td>Work production</td>
</tr>
<tr>
<td></td>
<td>Intrinsic motivation</td>
<td>Extrinsic motivation</td>
</tr>
<tr>
<td>Interpersonal context</td>
<td>Prosocial helping</td>
<td>Individual performance evaluation</td>
</tr>
<tr>
<td>Fishing script excerpt</td>
<td>“Let's pretend that you are a fisherman/fishewoman.”</td>
<td>“You can earn a sticker by doing the fishing task.”</td>
</tr>
<tr>
<td>Puzzle script excerpt</td>
<td>“Let's pretend that you are an animal helper.”</td>
<td>“You can earn a sticker by doing the puzzle task.”</td>
</tr>
</tbody>
</table>
**Fishing activity.** In the *playful condition*, the fishing activity was framed as pretend role-play, emphasizing intrinsic motivation and prosocial helping. The child was introduced to a “family” of three toy figurines (father, mother, and child). Next, the experimenter said, “Let's pretend that you are a fisherman/fisherwoman. This family is hungry, and they love to eat fish. You can feed them by catching fish from the pond. The more you catch, the more you can all eat together.” In the *non-playful condition*, the fishing activity was framed as work production, with a script emphasizing extrinsic motivation and individual performance evaluation. The child was shown a box of colorful stickers, and the experimenter said, “You can earn a sticker by doing the fishing task. I will be counting how many fish you catch, so you should try as hard as you can. The more fish you catch, the better.”

Before beginning the fishing activity, children in both conditions were given a brief demonstration of how to catch the fish, and were shown the fishing bucket into which they could place the fish that they caught. Children were told that that they could stop fishing at any time they wanted, and they were asked to indicate this by saying “I want to stop.” To make sure that children understood the directions, they were asked to repeat what they would say if they wanted to stop. During the fishing activity, the experimenter sat a distance away from the child and busied himself with paperwork, thus minimizing social interaction with the child. Figure 1 is a photograph of the setup for the fishing activity, with the fish in the foreground and the chair in which the experimenter sat in the background.
As children caught each fish, they placed it in the plastic fishing bucket, and then attempted to catch the remaining fish. The first part of the fishing activity involved children catching (or attempting to catch) all of the possible fish, which allowed children’s *performance* to be measured. If children caught all the possible fish and only the impossible fish remained, the second portion of the activity began, which measured children’s *persistence* in attempting to catch the impossible fish. Pretend play breaks with the fish were allowed (as in Chiu & Alexander, 2000), but these breaks from fishing activity involving play were not counted toward children’s time spent fishing, nor was private speech used during that period counted. Children were considered to be taking a play break if their playful non-engagement in fishing lasted for 5 seconds or more. Non-engagement in fishing was operationalized as not actively holding moving one’s fishing rod in pursuit of fish (e.g. putting it down or letting go of the rod) or moving away from the fishing area. The fishing activity ended when a child said that he or she wanted to stop, or when a child stopped

*Figure 1. Photo of the fishing activity setup.*
fishing for more than 10 continuous seconds, and was not otherwise engaged in play (children’s
desire to stop was still verbally confirmed). After stopping, all children in both conditions were
given stickers, and the experimenter helped children catch the impossible fish by turning it on its
side, thus making it possible to catch.

**Puzzle activity.** In the *playful condition*, the puzzle activity was framed as pretend role-
play, emphasizing intrinsic motivation and prosocial helping. The child was introduced to a
different family of three toy figurines (father, mother, and child). The experimenter introduced a
set of three barnyard puzzles by saying, “Let's pretend that you are an animal helper. This family
lives on a farm, and they had some farm animals. But they accidentally left the barn gate open and
the animals ran away! You can help the family get their missing animals back by putting together
these puzzles of their animals. The more pieces you put together, the more animals you will help
come back home.” In the *non-playful condition*, the puzzle activity was framed as work
production, with a script emphasizing extrinsic motivation and individual performance evaluation.
The child was shown a box of colorful stickers, and the experimenter introduced the barnyard
puzzles by saying, “You can earn a sticker by doing the puzzle task. I’ll be counting how many
puzzle pieces you put together, so you should try as hard as you can. The more puzzle pieces you
put together, the better.” Children in each condition were then asked, “Would you like to try an
easy or tricky puzzle?” which allowed a measure of challenge seeking to be recorded. In the
second portion of the puzzle activity, which involved a zoo puzzle, children in each condition
received a similar playful or non-playful framing of the puzzle. In sum, children completed three
barnyard puzzles in the first part of the task, followed by a more complex zoo puzzle that children
could work on with help from the experimenter, as needed.
Before beginning the puzzle activity, children in both conditions were told that they could stop doing puzzles at any time, and they were asked to indicate this by saying “I want to stop.” To make sure that children understood the directions, they were asked to repeat what they would say if they wanted to stop. During the puzzle activity, the experimenter again busied himself with paperwork, thus minimizing social interaction with the child. Pretend play with puzzle pieces was allowed, but these breaks were not counted toward children’s time of engagement with the puzzles, nor was private speech used during that period counted. Children were considered to be taking a play break if their playful non-engagement with the puzzles lasted for 5 seconds or more. As with the fishing activity, the puzzle activity ended when a child said that he or she wanted to stop, or when the child stopped engaging with the puzzles for more than 10 continuous seconds, and was not otherwise engaged in play (children’s desire to stop was still verbally confirmed). After stopping, all children in both conditions were given stickers, and the experimenter helped children to complete the puzzle they were working on if they so desired.

**Conceptual division of activities.** Conceptually, each activity was divided into two parts, each focusing on different components of mastery motivation. Private speech used while each motivation component was measured was considered highly relevant to that motivation component. The motivation components measured in each portion of the activities, along with their behavioral measures and relevant private speech are shown in Table 3.
Table 3

*Mastery motivation components, measures, and relevant private speech for each activity*

<table>
<thead>
<tr>
<th>Activity and MM component</th>
<th>Behavioral measure</th>
<th>Corresponding PS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>Proportion of possible fish caught</td>
<td>PS during possible fish is performance-relevant</td>
</tr>
<tr>
<td>Persistence</td>
<td>Time of persistence on impossible fish</td>
<td>PS during impossible fish is persistence-relevant</td>
</tr>
<tr>
<td>Puzzles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Challenge seeking</td>
<td>Choice of easy or tricky puzzle</td>
<td>No PS is collected during puzzle choice</td>
</tr>
<tr>
<td>Performance</td>
<td>Number of barnyard puzzle pieces completed in 5 min</td>
<td>PS during barnyard puzzles is performance-relevant</td>
</tr>
<tr>
<td>Independence</td>
<td>Choice to attempt zoo puzzle pieces him/herself or have the experimenter do it</td>
<td>PS during zoo puzzle is independence-relevant</td>
</tr>
</tbody>
</table>

*Note:* MM = Mastery motivation. PS = Private speech.

For the fishing activity, the first part of the activity involved children catching (or attempting to catch) all of the possible fish, which allowed children’s *performance* to be measured. If children caught all of the possible fish and only the impossible fish remained, the second portion
of the activity began, which measured children’s *persistence* in attempting to catch the impossible fish. By chance, children sometimes spent brief periods of time on the impossible fish before catching all of the possible fish. However, this time spent attempting to catch the impossible fish before all of the possible fish were caught was not counted toward persistence. Only time spent trying to catch the impossible fish when it was the last remaining fish was counted toward persistence. This seemed to be a more accurate measure of persistence, as children were confronted with the fact that only one fish remained, and they were having difficulty catching it (as it was impossible). Following this structure, children’s private speech was subdivided into private speech used while catching the possible fish (considered *performance-relevant*) and private speech used while attempting to catch the impossible fish (considered *persistence-relevant*). This design allowed investigation of the relation between composite mastery motivation and overall private speech, as well as the relation between specific mastery motivation components (performance and persistence) and private speech that was temporally proximate, and thus highly relevant to measures of these specific motivation components. Thus, private speech that children used while pursuing the possible fish was considered to be *performance-relevant*, and private speech used while pursuing the impossible fish was considered to be *persistence-relevant*. Mirroring the design structure above, private speech used on the impossible fish while other fish remained was considered performance-relevant; only private speech used on the impossible fish when it was the last remaining fish was considered persistence-relevant.

As with the fishing activity, the puzzle activity was divided into two parts, each focusing on different mastery motivation components. The first part entailed *challenge seeking*, in which children could choose to work on an “easy” or “tricky” puzzle (the same subsequent puzzle sequence is given either way). The first part also examined students’ *performance* as they put
together three 12-piece barnyard puzzles in the following order: chicken puzzle, cow puzzle, horse puzzle. As the child completed each barnyard puzzle, the next puzzle was brought out. After five minutes (the experimenter surreptitiously kept time), the experimenter allowed the child to finish the puzzle they were currently working on, and the first portion of the puzzle activity was concluded. The number of pieces that the child correctly assembled at the five-minute mark was coded later using the videotape. The second portion of the puzzle activity measured children’s \textit{independence} in attempting to complete a 24-piece zoo puzzle. After the child had assembled four puzzle pieces, the experimenter said: “Would you like me to do the next puzzle piece for you, or do you want to try it yourself?” If the child indicated that he/she wanted the experimenter to do it, this constituted the end of this measure, and the child received the lowest score for independence. If the child chose to attempt the piece his/herself, the experimenter repeated the question on the 10\textsuperscript{th} piece, and if the child again chose to keep working independently the questions was repeated for the final time on the 15\textsuperscript{th} piece (refusing all offers resulted in the highest independence score). Following this two-part structure, children’s private speech on the puzzle activity was subdivided into private speech used during the barnyard puzzles (performance-relevant) and private speech used during the zoo puzzle (independence-relevant). This allowed investigation of the relation between composite mastery motivation and overall private speech, as well as the relation between mastery motivation components and relevant, temporally proximate private speech.

\textbf{Measures}

\textbf{Mastery motivation.} Indicators of mastery motivation on the fishing activity were children’s performance and persistence in catching fish. Performance was operationalized as the percentage of fish that children caught (fish caught out of total fish in the pond). Using a percentage rather than a count of fish caught controlled for the fact that older children were given
six fish to catch, while younger children were given only five. Also noted was the time that children spent trying to catch the possible fish. Persistence was operationalized as the amount of time that children persisted in trying to catch the last, impossible fish. Timing for persistence began after all possible fish were caught, and only the impossible fish remained. Because catching the possible fish required persistence related to mastery motivation, children who quit fishing before catching all of the possible fish received a persistence time of zero.

Indicators of mastery motivation on the puzzle activity were children’s challenge seeking, performance, and independence in solving puzzles. Challenge seeking was operationalized as whether the child initially chooses to attempt an “easy” or “tricky” puzzle, with children who chose a “tricky” puzzle receiving a higher score (one point) on challenge seeking than those choosing an “easy” puzzle (zero points). Performance was operationalized as the number of barnyard puzzle pieces that the child successfully connected (totaling across the barnyard puzzles) in the first five minutes of working on these puzzles, with more puzzle pieces connected indicating higher performance. Based on piloting, it was highly unlikely that the child would complete all three puzzles in five minutes, thus eliminating a ceiling on performance scores. Children’s independence in constructing the zoo puzzle was operationalized as whether the child accepted the experimenter’s offer (or repeated offers) to do a puzzle piece for the child. The lowest score on independence (zero points) meant that the child accepted the experimenter’s first offer to do the puzzle piece for them. The highest score on independence (three points) entailed the child declining the experimenter’s three offers to do a puzzle piece for them, and instead choosing to attempt all three pieces themselves. To examine children’s overall mastery motivation for the fishing and puzzle activities, as well as for both activities combined, the measures of individual mastery motivation components described above were transformed into z-scores (which indicate
the number of standard deviations above or below the mean for each measure). These z-scores were then averaged within and across activities to create composite mastery motivation scores.

**Private speech measures.** Children’s speech was transcribed from the video recordings and separated into discrete utterances, the typical unit of analysis in private speech research (Winsler, Fernyhough, McLaren, & Way, 2005). Utterances were defined as complete sentences, sentence fragments, clauses with intentional markers of termination, conversational turns, or any string of speech that is separated from another by at least 2 seconds (Winsler et al., 2005). Utterances were separated into social and private speech, and only private speech was then analyzed. Social speech was defined as any verbalization intended for communication to another individual as indicated by a name, pronoun reference, a gaze at another person during or within one second of the utterance, an intentional physical touch of another person, or a verbal turn-taking episode (Winsler, Carlton, & Barry, 2000). Private speech included any verbalizations which did not contain one of these social markers, including inaudible muttering and silent verbal lip movements. Once private speech utterances were identified, private speech was analyzed and coded while watching the video.

Private speech utterances were classified as either cognitive, motivational, metacognitive, playful, or partially internalized private speech. This coding scheme was synthesized from Berk (1986), Chiu and Alexander (2000), de Dios and Montero (2003), and Atencio (2003), with the category of imaginative private speech added due to its special relevance in comparing playful and non-playful contexts. This new coding scheme combined developmental elements (partially internalized private speech), categories based on semantic content/function (cognitive, motivational, metacognitive, playful), and an emotional valence dimension culled from research on the valence of self-talk in sport and clinical psychology. Table 4 depicts these categories,
descriptions, examples of each subcategory, and subcategory valences. To establish interrater reliability, 20% of the transcripts were randomly selected to be independently coded by a second rater. According to criteria in Landis and Koch (1977), interrater reliability ($\kappa = .87$) reflected excellent strength of agreement across the five private speech categories.

Table 4

*Coding scheme for private speech, with description of primary categories and subcategories*

<table>
<thead>
<tr>
<th>PS category or subcategory</th>
<th>Description or Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Cognitive PS</td>
<td></td>
</tr>
<tr>
<td>Thinking</td>
<td>“Hm, maybe I can catch it by the tail.”</td>
</tr>
<tr>
<td>Planning</td>
<td>“I’ll get the blue one, and then the green one.”</td>
</tr>
<tr>
<td>Self-guiding</td>
<td>“Move it a little bit to the left.”</td>
</tr>
<tr>
<td>Enacting strategies</td>
<td>“Let’s tilt the pole down to get it.”</td>
</tr>
<tr>
<td>(2) Motivational PS</td>
<td></td>
</tr>
<tr>
<td>Emotional reactions</td>
<td></td>
</tr>
<tr>
<td>Positive (+)</td>
<td>“Yes!”</td>
</tr>
<tr>
<td>Negative (-)</td>
<td>“Aw, man!”</td>
</tr>
<tr>
<td>Self-evaluation</td>
<td></td>
</tr>
<tr>
<td>Positive (+)</td>
<td>“I can do this.”</td>
</tr>
<tr>
<td>Negative (-)</td>
<td>“I’m not a good fisherman.”</td>
</tr>
<tr>
<td>Task-evaluation</td>
<td></td>
</tr>
<tr>
<td>Positive (+)</td>
<td>“This is so easy.”</td>
</tr>
<tr>
<td>Negative (-)</td>
<td>“This fish is really hard.”</td>
</tr>
<tr>
<td>Self-encouragement (+)</td>
<td>“Come on, let’s get that fish!”</td>
</tr>
<tr>
<td>Agentic</td>
<td>“I really want to catch this fish.”</td>
</tr>
</tbody>
</table>
(3) Metacognitive PS

- Recognizing solutions, monitoring errors, or reflecting upon the goal-oriented task process itself.
  - Solving speech: “I figured it out” “Now I’ve got it.”
  - Monitoring/correcting errors: “No, that’s not the way.”
  - Reflecting on task progress: “Three fish caught, two more to go.”
  - Reflecting on one’s own thinking or knowledge: “I don’t know which one is right.”

(4) Imaginative PS

- Entering an imaginary scenario, creating a new pretend scenario, or imagining objects as animate.
  - Entering pretend scenario: “I’ll catch these fish so the family won’t be hungry.”
  - Creating pretend scenario: “My dinosaur will suck up the water to help me fish!”
  - Addressing objects as living: “Here fishy fishy…”

(5) Partially Internalized PS

- The partially internalized form of the utterance prevents categorization in one of the functional categories above.
  - Extremely low volume (e.g. Inaudible muttering): “That’s the…” “I - ”
  - Grammatically fragmented: “Pink.”
  - Semantically condensed: “Pink.”

Note: PS = Private speech. (+) = Motivational PS subcategory with a positive valence. (-) = Motivational PS subcategory with a negative valence.

*Cognitive private speech* was coded when children used private speech to think, plan, or self-guide their strategic behavior in relation to the activity. Examples included utterances such as “Hm, maybe I can catch it by the tail,” “I think this piece is the chicken’s beak,” “I’ll get the blue one, then the green one,” and “Let’s tilt the pole down to get it.” *Motivational private speech* was coded when private speech expressed affect, agency, or conation. This included emotional reactions (positive or negative), evaluations of the task or oneself, self-exhortations and self-encouragement, and expressions of desire or need. Examples include utterances such as “Aw,
man!" “This is so easy,” “I’m not a good fisherman,” “Come on, you can do it!” or “I really need to fit this puzzle piece.” In this coding scheme, the literal, lexical elements of the utterance were used as the primary tier for coding. Affective, emotional aspects of the utterance served as a secondary coding tier that was used only if the literal meaning of the words was vague, but the emotion was clear (e.g. “Yes!” as a positive emotional reaction or “Aw, man!” as a negative emotional reaction). The primacy of lexical elements of affective elements in coding will be further clarified in the following paragraph.

Metacognitive private speech was coded when the child used private speech to reflect on their own cognition or on the goal-oriented process of the activity itself. This could take the form of monitoring and self-correcting errors, recognizing solutions to a problem, commenting on progress toward the goal, or reflecting on one’s own thinking or knowledge. Examples included utterances such as “No, that’s wrong,” “Now I’ve got it,” “Three fish caught, two more to go,” and “I’m not sure which piece goes here.” Once again, the lexical aspect of the utterance was primary in coding. Thus, even if the phrase “No, that’s wrong” was spoken with some negative emotion, because the literal words as written indicate correcting an error, this utterance would be coded as metacognitive (monitoring/correcting errors), rather than as motivational (negative emotional reaction). Similarly, even if the utterance “Now I’ve got it” was spoken with some positive emotion, the lexical aspect of the utterance predominates, and it would thus be coded as metacognitive (solving speech). However, if the lexical aspect was too vague to be coded as solving speech (e.g. “Yes!”) but the positive emotion was clear, the utterance would be coded as motivational (positive emotional reaction).

Imaginative private speech was coded when the child’s private speech invoked non-literal pretense in the form of a pretend role or imaginary scenario beyond the mere task at hand. This
sociodramatic, imaginative speech took the form of embracing or embellishing the pretend scenario in the script for the playful conditions (e.g., “I’m gonna get these animals back so the family won’t be sad”), as well as creating imaginary scenarios that went beyond the initial play script (e.g., “My dinosaur will suck up all the water to help me catch the fish!”). Also coded as playful was private speech that addressed or referred to inanimate objects as if they were living beings or in an imaginary situation (e.g., “Here fishy fishy…” “This fish doesn’t want to be caught” “Come back home, cow!”). Because this category of private speech was modeled on the key elements of sociodramatic play, other forms of speech that were superficially playful but did not involve entering pretend situations or creating imaginary scenarios were not included in this category. This included word play (“Fishy-wishy-wishy”), singing/chanting unrelated songs, and sound effects (e.g. making an exploding noise while placing a puzzle piece).

*Partially internalized private speech* was coded when the auditory, semantic, or grammatical form of the child’s private speech did not allow it to be categorized in one of the previous four functional categories. This occurred when the utterance was too low in volume to be understood, or was so grammatically fragmented or condensed that its meaning and function were unclear. Examples included barely audible muttering, whispering, and truncated and unclear utterances such as “Pink,” “I-” and “That’s the…” Based on the Vygotskian notion that the unarticulated or subarticulated parts of such utterances indicate the presence of inner speech or internalized meaning (Vygotsky, 1934/1986), private speech utterances in this category were characterized as partially covert or internalized. This method of coding partially internalized private speech by its unique phonetic, semantic, or grammatical form (e.g., low volume, semantic condensation, or grammatical fragmentation) is a departure from the Berk (1986) coding scheme. Berk’s coding scheme, by contrast, codes partially internalized private speech based solely on its
phonetic aspects (e.g. inaudible whispering or muttering). While the Berk (1986) coding scheme has been the predominant method of coding partially internalized private speech used by researchers to date, the original Vygotskian concept of partially internalized private speech includes semantic condensation and grammatical fragmentation as well. This is because the grammatical or semantic aspects that are not voiced in fully external fashion are being processed on an internal plane as part of children’s *inner speech*, or verbal thinking. Thus, the current coding scheme expands the operational definition of partially internalized private speech in order to more fully elaborate the Vygotskian theoretical position in regard to such private speech.

Based on self-talk valence literature, certain subcategories of motivational private speech were designated as carrying a positive valence, negative valence, or no valence. Within the motivational private speech category, *emotional reactions* involving positive emotions (e.g., joy, excitement, satisfaction) and *evaluations of the task or oneself* that were encouraging or optimistic were coded as positively valenced. *Emotional reactions* involving negative emotions (e.g., frustration, sadness, anger) or *evaluations of the task or oneself* that were critical or pessimistic were coded as negatively valenced (c.f. Alfano, Beidel, & Turner, 2006). Based on the valence dimensions used in the Self-talk and Gestures Rating System (STAGRS; Van Raalte, 1994), motivational *self-encouragement* was also coded as positively valenced.

Both frequencies (utterances per minute) and proportions (percentage of total utterances) were calculated for each private speech category. Using private speech frequencies (utterances per minute) has an advantage over raw utterance counts, in that they control for differences in the amounts of time that children spent fishing. The use of private speech proportions (utterances of a certain category out of total utterances) provides additional insight because proportions control for individual differences in private speech frequency, which have been found to be relatively large.
and stable over time (Winsler, De Leon, Wallace, Carlton, & Willson-Quayle, 2003). Finally, a valence ratio (positively valenced utterances out of total valenced utterances) for motivational private speech was also calculated.

For the subgroup comparison of bilinguals’ and monolinguals’ private speech, developmental sophistication in private speech was operationalized as children’s frequency and proportion of partially internalized private speech. Following the method used by Diaz, Padilla, and Weathersby (1991), children’s diversity of private speech functions was measured via the total number of distinct functional private speech categories that children used across both activities. As per the study’s coding scheme (displayed in Table 4), the functional private speech categories included cognitive, motivational, metacognitive, and imaginative private speech. Because partially internalized private speech is a category based on form rather than function, it was excluded from the functional diversity analysis.
CHAPTER 6

Results

Data Summary and Preliminary Analyses

An initial overview of study results indicated that all but two children (4.3%) used at least some private speech on the fishing activity, and all but two children (4.3%) used private speech on the puzzle activity (and these were different children in each case). Play breaks comprised 4.7% of children’s total time on both activities, and did not differ significantly between the playful and non-playful conditions ($p = .23$, n.s.). Study variables were checked for univariate outliers. Based on recommendations from Pedhazur and Schmelkin (1991), once outliers were confirmed as not due to error, they were kept in the analysis rather than eliminated. Nearly all private speech variables evidenced a positive skew greater than 1.0, as might be expected from a count-based variable. To minimize the impact of outliers and/or skew in measuring correlations between private speech and mastery motivation, Spearman’s rank correlations were employed in all subsequent analyses to examine the correlations between private speech and mastery motivation variables.

Children’s ranks in age were found to be unrelated to their ranks in any mastery motivation measures (all $p$ values > .25). This lack of an age effect on mastery motivation aligns with past research (Chiu & Alexander, 2000; Jennings, Conners, & Stegman, 1988). Child age was related to various private speech categories, however, and these Spearman rank correlations are reported in Table 5.
Table 5

*Spearman correlations between child age and composite private speech variables for both activities combined*

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Private speech frequencies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total PS/min</td>
<td>.24</td>
<td>.107</td>
</tr>
<tr>
<td>Cognitive PS/min</td>
<td>-.06</td>
<td>.707</td>
</tr>
<tr>
<td>Motivational PS/min</td>
<td>.01</td>
<td>.935</td>
</tr>
<tr>
<td>Metacognitive PS/min</td>
<td>.22</td>
<td>.145</td>
</tr>
<tr>
<td>Imaginative PS/min</td>
<td>-.02</td>
<td>.919</td>
</tr>
<tr>
<td>Internalized PS/min</td>
<td>.52***</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>Private speech proportions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive PS%</td>
<td>-.25*</td>
<td>.093</td>
</tr>
<tr>
<td>Motivational PS%</td>
<td>-.33*</td>
<td>.027</td>
</tr>
<tr>
<td>Metacognitive PS%</td>
<td>.16</td>
<td>.291</td>
</tr>
<tr>
<td>Imaginative PS%</td>
<td>-.11</td>
<td>.470</td>
</tr>
<tr>
<td>Internalized PS%</td>
<td>.54***</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>PS valence ratio</td>
<td>.09</td>
<td>.562</td>
</tr>
</tbody>
</table>

*Note:* PS/min = Private speech utterances per minute. PS% = Proportion (percentage) of total private speech utterances. *p < .10; *p < .05; **p < .01; ***p < .001.

As predicted based on the developmental trajectory of speech internalization, children’s age was strongly correlated with both their frequency and proportion of partially internalized private speech.


speech. Figure 2 displays a scatterplot of the positive linear relation between children’s ranks in age and their ranks in frequency of partially internalized private speech.

![Scatterplot](image)

**Figure 2.** Relation between children’s ranks in age and frequency of partially internalized private speech.

Similarly, Figure 3 displays a scatterplot of the positive linear relation between children’s ranks in age and their ranks in proportion of partially internalized private speech.
At the same time, children’s proportion of motivational private speech was negatively related to age, and proportion of motivational private speech showed a marginal negative trend with age. Thus, older children tended to use more partially internalized private speech, but less motivational private speech. Figure 4 displays a scatterplot of the negative linear relation between children’s ranks in age and their ranks in proportion of motivational private speech.
Due to these significant correlations between child age and various categories of private speech, age was included as a covariate in all subsequent comparisons of group means. Thus, all comparisons of group means were conducted using one-way analyses of covariance (ANCOVA), with age as the covariate. For within-child repeated-measures comparisons of group means between fishing and puzzle activities, repeated-measures analysis of variance (RM ANOVA) was used. Because these were within-child comparisons, no covariate adjustments for child age were necessary, so age was not included as a covariate in these comparisons.

**Individual Differences and Activity Effects on Motivation and Private Speech**

To examine the stability of individual differences across activities, Spearman rank correlations between fishing and puzzle activities were calculated for mastery motivation and private speech variables. To explore the potential effects of different activities (with their different cognitive and motor demands) on children’s aggregate private speech use, repeated-measures
ANOVAs compared children’s mean private speech levels between activities. For composite mastery motivation, a non-significant correlation \((r = .14, \text{n.s.})\) indicated that children’s ranks in mastery motivation were not stable from one activity to the other. For all private speech variables, Table 6 displays Spearman rank correlations along with means and standard deviations. The table also includes flags indicating the variables for which repeated-measures ANOVAs revealed mean differences in children’s private speech between activities.

Table 6

*Means and standard deviations of private speech variables by activity across conditions, with cross-activity consistency (Spearman’s \(r\)) and activity-based differences*\(^a\)

<table>
<thead>
<tr>
<th></th>
<th>Fishing</th>
<th></th>
<th>Puzzles</th>
<th></th>
<th>(r)</th>
<th>(p) value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>(SD)</td>
<td>Mean</td>
<td>(SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total PS/min</td>
<td>2.19</td>
<td>(2.03)</td>
<td>2.47</td>
<td>(1.93)</td>
<td>.39**</td>
<td>.009</td>
</tr>
<tr>
<td>Frequency of PS categories</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive PS/min (^{aa})</td>
<td>0.29</td>
<td>(0.45)</td>
<td>0.69</td>
<td>(0.81)</td>
<td>.38*</td>
<td>.012</td>
</tr>
<tr>
<td>Motivational PS/min (^{aaa})</td>
<td>0.60</td>
<td>(0.58)</td>
<td>0.26</td>
<td>(0.26)</td>
<td>.21</td>
<td>.163</td>
</tr>
<tr>
<td>Metacognitive PS/min</td>
<td>0.44</td>
<td>(0.54)</td>
<td>0.46</td>
<td>(0.49)</td>
<td>.31*</td>
<td>.043</td>
</tr>
<tr>
<td>Imaginative PS/min (^a)</td>
<td>0.34</td>
<td>(0.56)</td>
<td>0.11</td>
<td>(0.24)</td>
<td>.39**</td>
<td>.009</td>
</tr>
<tr>
<td>Internalized PS/min</td>
<td>0.46</td>
<td>(0.54)</td>
<td>0.61</td>
<td>(0.69)</td>
<td>.46**</td>
<td>.003</td>
</tr>
<tr>
<td>Proportions of PS categories</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive PS(^{aaa})</td>
<td>13.5%</td>
<td>(15.4%)</td>
<td>33.2%</td>
<td>(25.5%)</td>
<td>.12</td>
<td>.446</td>
</tr>
<tr>
<td>Motivational PS(^{aaa})</td>
<td>31.6%</td>
<td>(22.8%)</td>
<td>11.8%</td>
<td>(13.6%)</td>
<td>.08</td>
<td>.617</td>
</tr>
<tr>
<td>Metacognitive PS(^)</td>
<td>17.3%</td>
<td>(16.2%)</td>
<td>17.9%</td>
<td>(16.4%)</td>
<td>.27*</td>
<td>.085</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td>--------------------------</td>
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<td>----------</td>
<td>----------</td>
<td>--------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>Imaginative PS%</td>
<td>10.4%</td>
<td>(12.6%)</td>
<td>3.7%</td>
<td>(7.7%)</td>
<td>.26+</td>
<td>.095</td>
</tr>
<tr>
<td>Internalized PS%</td>
<td>24.2%</td>
<td>(24.0%)</td>
<td>21.1%</td>
<td>(19.7%)</td>
<td>.37*</td>
<td>.018</td>
</tr>
<tr>
<td>PS valence ratio</td>
<td>0.23</td>
<td>(0.27)</td>
<td>0.38</td>
<td>(0.44)</td>
<td>.24</td>
<td>.249</td>
</tr>
</tbody>
</table>

*Note: SD = Standard deviation. PS/min = Private speech utterances per minute. PS% = Proportion (percentage) of total private speech utterances. +p < .10; *p < .05; **p < .01.

Significant activity effect in ANOVA: a p < .05; aa p < .01; aaa p < .001.

As seen in Table 6, while children’s private speech correlations between activities were never negative, there was somewhat more variability than expected in the strength of association (r’s from .08 to .46), which ranged from trivial to medium-large according to Cohen’s (1992) criteria. Stable relations in rank were found for six of 12 private speech variables (r’s from .31 to .46), including children’s frequency of total private speech, cognitive private speech, metacognitive private speech, imaginative private speech, and for children’s frequency and proportion of partially internalized private speech. Children’s proportions of metacognitive (p = .085) and imaginative private speech (p = .095) showed marginal trends toward stability. Relative ranks were not maintained in children’s frequency and proportion of motivational private speech, nor in the valence of motivational speech (r’s from .08 to .21). Thus, children’s relative ranking in motivational private speech and its emotional valence appeared to fluctuate more than other forms of private speech.

As predicted, and as indicated by the flags in Table 13, repeated-measures ANOVAs revealed differences in children’s mean use of private speech between activities on six of 12 private speech measures. On the fishing activity, children used significantly more motivational private speech in terms of both frequency $F(1, 43) = 13.48, p < .001$ and proportion $F(1, 40) = 26.74, p < .001$, as well as more imaginative private speech in terms of frequency $F(1, 43) = 7.38,$
\[ p = .009 \text{ and proportion } F(1, 40) = 9.78, \ p = .003 \] than they did on the puzzle activity. In contrast, on the puzzle activity children used more cognitive private speech in terms of frequency \( F(1, 43) = 11.01, p = .002 \) and proportion, \( F(1, 40) = 22.38, p < .001 \) than they did while fishing. In sum, the fishing activity seemed to elicit more motivational and imaginative private speech, while the puzzle activity seemed to prompt children to use more cognitive private speech. Because individual children’s mastery motivation and the categories of private speech that they used were relatively activity-specific, separate analyses for each activity were included for each research question, in addition to analyses that combined both activities.

**Mastery Motivation in Playful versus Non-Playful Condition**

To compare the relative impact of playful and non-playful conditions on children’s mastery motivation and its components, group means were compared using ANCOVA analyses with age as the covariate. Table 7 provides a summary of estimated means (covariate-adjusted for age) and ANCOVA results for mastery motivation and its components by condition for both activities combined, as well as fishing and puzzle activities considered separately.

As described earlier, a composite score for mastery motivation for both activities combined was created by averaging children’s \( z \)-scores on performance, persistence, challenge seeking, and independence across both fishing and puzzle activities. As predicted, for both activities combined children in the playful context showed higher levels of composite mastery motivation than children in the non-playful context \( (d = .91, \text{ large effect size}) \). The mastery motivation composite was then separated into performance and non-performance motivation components, which were also composed of \( z \)-scores that were averaged across activities. The performance composite for both activities combined showed a marginal trend toward better performance among children in the playful condition, though this difference was not significant \( (p = .068) \). Children in the playful
A PLAYFUL CONTEXT ENHANCES MOTIVATION

Table 7
*Estimated means and standard deviations for mastery motivation and components by condition, with ANCOVA results (age as covariate)*

<table>
<thead>
<tr>
<th></th>
<th>Playful</th>
<th>Non-Playful</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>(SD)</td>
<td>n</td>
<td>Mean</td>
<td>(SD)</td>
<td>n</td>
<td>F</td>
</tr>
<tr>
<td>Both Activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MM composite (z-score)</td>
<td>0.25</td>
<td>(0.56)</td>
<td>24</td>
<td>–0.25</td>
<td>(0.50)</td>
<td>23</td>
<td>9.81**</td>
</tr>
<tr>
<td>Persistence/Challenge seeking/Independence (z-score)</td>
<td>0.32</td>
<td>(0.87)</td>
<td>24</td>
<td>–0.31</td>
<td>(0.59)</td>
<td>23</td>
<td>7.94**</td>
</tr>
<tr>
<td>Performance (z-score)</td>
<td>0.18</td>
<td>(0.61)</td>
<td>24</td>
<td>–0.19</td>
<td>(0.72)</td>
<td>23</td>
<td>3.51+</td>
</tr>
<tr>
<td>Fishing Activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fishing MM composite (z-score)</td>
<td>0.25</td>
<td>(0.59)</td>
<td>23</td>
<td>–0.25</td>
<td>(0.93)</td>
<td>22</td>
<td>7.03*</td>
</tr>
<tr>
<td>Persistence (time in sec)</td>
<td>443</td>
<td>(333)</td>
<td>23</td>
<td>261</td>
<td>(207)</td>
<td>22</td>
<td>4.64*</td>
</tr>
<tr>
<td>Performance (% fish caught)</td>
<td>81.6%</td>
<td>(4.5%)</td>
<td>23</td>
<td>69.4%</td>
<td>(26.7%)</td>
<td>22</td>
<td>4.51*</td>
</tr>
<tr>
<td>Puzzle Activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puzzle MM composite (z-score)</td>
<td>0.20</td>
<td>(0.82)</td>
<td>24</td>
<td>–0.19</td>
<td>(0.62)</td>
<td>22</td>
<td>3.18+</td>
</tr>
<tr>
<td>Challenge seeking/Independence (z-score)</td>
<td>0.31</td>
<td>(0.97)</td>
<td>23</td>
<td>–0.33</td>
<td>(0.93)</td>
<td>22</td>
<td>5.04*</td>
</tr>
<tr>
<td>Performance (puzzle pieces)</td>
<td>15.37</td>
<td>(8.39)</td>
<td>24</td>
<td>13.78</td>
<td>(12.32)</td>
<td>22</td>
<td>0.25</td>
</tr>
</tbody>
</table>

*Note: MM = Mastery motivation. SD = Standard deviation. *p < .10; **p < .05; ***p < .01.*
condition scored higher on the motivation composite of persistence, challenge seeking, and independence ($d = .82$, large effect size).

For the fishing activity, a composite mastery motivation score was created by averaging children’s $z$-scores on performance and persistence. As predicted, children in the playful context showed higher levels of composite mastery motivation than children in the non-playful context ($d = .79$, medium effect size). Children in the playful condition scored higher on both performance ($d = .63$, medium effect size) and persistence ($d = .64$, medium effect size) components of mastery motivation when they were considered separately. Thus, children in the playful condition caught a higher percentage of fish than children in the non-playful condition, and persisted longer on the impossible fish. Every child (23/23, 100%) in the playful condition caught all of the possible fish, while only 82% (18/22) of children in the non-playful condition caught all of the possible fish (Fisher’s exact test, $p = .049$).

For the puzzle activity, a composite mastery motivation score was created by averaging children’s $z$-scores on performance, challenge-seeking, and independence. Children in the playful context showed a marginal trend toward higher composite mastery motivation ($d = .53$), though this comparison was non-significant ($p = .099$). The puzzle mastery motivation composite was then separated into performance and non-performance motivation components. Children in the playful condition scored higher on the motivation composite of challenge seeking and independence than children in the non-playful condition ($d = .67$, medium effect size). Thus, children in the playful condition chose to attempt a challenging puzzle more often, and worked more independently on a challenging puzzle than children in the non-playful condition. Children’s performance on puzzles, however, did not differ between conditions.

**Overall Private Speech in Playful versus Non-Playful Condition**
To compare the relative impact of playful and non-playful conditions on children’s overall frequency of private speech use, group means were compared using ANCOVA analyses with age as the covariate. Table 8 provides a summary of estimated means and ANCOVA results for private speech frequencies by condition for both activities combined, as well as fishing and puzzle activities considered separately.

Table 8

*Estimated means and standard deviations for overall private speech frequency by condition, with ANCOVA results (age as covariate)*

<table>
<thead>
<tr>
<th></th>
<th>Playful</th>
<th></th>
<th>Non-Playful</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>(SD)</td>
<td>n</td>
<td>Mean</td>
</tr>
<tr>
<td>Both Activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total PS/min</td>
<td>2.62</td>
<td>(1.61)</td>
<td>24</td>
<td>1.63</td>
</tr>
<tr>
<td>F</td>
<td>6.85*</td>
<td>.015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fishing Activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Fishing PS/min</td>
<td>2.85</td>
<td>(2.44)</td>
<td>23</td>
<td>1.48</td>
</tr>
<tr>
<td>F</td>
<td>5.69*</td>
<td>.033</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible Fish PS/min</td>
<td>2.71</td>
<td>(2.84)</td>
<td>23</td>
<td>1.75</td>
</tr>
<tr>
<td>F</td>
<td>1.95</td>
<td>.170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impossible Fish PS/min</td>
<td>3.23</td>
<td>(3.11)</td>
<td>23</td>
<td>1.25</td>
</tr>
<tr>
<td>F</td>
<td>6.75*</td>
<td>.013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puzzle Activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Puzzle PS/min</td>
<td>2.84</td>
<td>(1.90)</td>
<td>24</td>
<td>2.09</td>
</tr>
<tr>
<td>F</td>
<td>1.73</td>
<td>.195</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnyard Puzzle PS/min</td>
<td>3.49</td>
<td>(3.14)</td>
<td>24</td>
<td>2.42</td>
</tr>
<tr>
<td>F</td>
<td>1.74</td>
<td>.194</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoo Puzzle PS/min</td>
<td>2.35</td>
<td>(1.82)</td>
<td>22</td>
<td>1.40</td>
</tr>
<tr>
<td>F</td>
<td>3.30*</td>
<td>.077</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: SD = Standard deviation. PS/min = Private speech utterances per minute. +p < .10; *p < .05.*
As predicted, for both activities combined children in the playful condition used significantly more frequent total private speech than children in the non-playful group ($d = .76$, medium effect size). On the fishing activity, children in the playful condition used significantly more frequent total private speech than children in the non-playful group ($d = .71$, medium effect size). Children in each condition used comparable frequencies of private speech while catching the possible fish, but children in the playful context used significantly more frequent private speech while attempting to catch the impossible fish ($d = .82$, large effect size), the most challenging portion of the fishing activity. On the puzzle activity, contrary to prediction, children’s frequency total private speech did not differ between conditions. While children in each condition used roughly comparable frequencies of private speech on the barnyard puzzles, there was a marginal trend ($p = .077$) toward children in the playful context using more frequent private speech on the zoo puzzle ($d = .55$), the most challenging portion of the puzzle activity.

**Private Speech Categories in Playful versus Non-Playful Condition**

To compare the relative impact of playful and non-playful conditions on children’s use of particular private speech functions, group means were compared using ANCOVA analyses with age as the covariate. Table 9 provides a summary of estimated means and ANCOVA results for frequencies and proportions of private speech categories by condition for both activities combined, as well as fishing and puzzle activities considered separately.

As predicted, children in the playful context used more frequent imaginative private speech than children in the non-playful context ($d = .73$, medium effect size). Unexpectedly, children in the playful condition also used more frequent cognitive ($d = .80$, large effect size) private speech, as well as a higher proportion of cognitive private speech than the non-playful condition ($d = .68$, medium effect size). Contrary to expectation, the emotional valence of
A PLAYFUL CONTEXT ENHANCES MOTIVATION

### Table 9
Estimated means and standard deviations for frequencies and proportions of private speech categories by condition, with ANCOVA results (age as covariate)

<table>
<thead>
<tr>
<th></th>
<th>Both Activities</th>
<th>Fishing Activity</th>
<th>Puzzle Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Playful</td>
<td>Non-Playful</td>
<td>Playful</td>
</tr>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>n</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>PS Frequencies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive PS/min</td>
<td>0.70 (0.52)</td>
<td>24</td>
<td>0.48 (0.54)</td>
</tr>
<tr>
<td></td>
<td>0.32 (0.41)</td>
<td>23</td>
<td>0.16 (0.26)</td>
</tr>
<tr>
<td>Motivational PS/min</td>
<td>0.47 (0.35)</td>
<td>24</td>
<td>0.72 (0.64)</td>
</tr>
<tr>
<td></td>
<td>0.34 (0.31)</td>
<td>23</td>
<td>0.44 (0.47)</td>
</tr>
<tr>
<td>Metacognitive PS/min</td>
<td>0.54 (0.54)</td>
<td>24</td>
<td>0.52 (0.57)</td>
</tr>
<tr>
<td></td>
<td>0.38 (0.45)</td>
<td>23</td>
<td>0.32 (0.48)</td>
</tr>
<tr>
<td>Imaginative PS/min</td>
<td>0.32 (0.38)</td>
<td>24</td>
<td>0.53 (0.70)</td>
</tr>
<tr>
<td></td>
<td>0.10 (0.18)</td>
<td>23</td>
<td>0.12 (0.21)</td>
</tr>
<tr>
<td>Internalized PS/min</td>
<td>0.63 (0.55)</td>
<td>24</td>
<td>0.53 (0.55)</td>
</tr>
<tr>
<td></td>
<td>0.42 (0.46)</td>
<td>22</td>
<td>0.39 (0.52)</td>
</tr>
<tr>
<td>PS Proportions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive PS%</td>
<td>28.1% (16.5%)</td>
<td>24</td>
<td>16.1% (15.6%)</td>
</tr>
<tr>
<td></td>
<td>16.9% (17.0%)</td>
<td>22</td>
<td>34.7% (26.1%)</td>
</tr>
<tr>
<td>Motivational PS%</td>
<td>17.9% (11.6%)</td>
<td>24</td>
<td>27.6% (19.8%)</td>
</tr>
<tr>
<td></td>
<td>23.4% (17.0%)</td>
<td>22</td>
<td>34.7% (26.1%)</td>
</tr>
<tr>
<td>Metacognitive PS%</td>
<td>15.2% (10.9%)</td>
<td>24</td>
<td>15.9% (11.0%)</td>
</tr>
<tr>
<td></td>
<td>20.6% (15.8%)</td>
<td>22</td>
<td>18.8% (20.8%)</td>
</tr>
<tr>
<td>Imaginative PS%</td>
<td>8.0% (8.9%)</td>
<td>24</td>
<td>12.5% (13.4%)</td>
</tr>
<tr>
<td></td>
<td>6.0% (8.7%)</td>
<td>22</td>
<td>8.4% (12.3%)</td>
</tr>
<tr>
<td>Internalized PS%</td>
<td>23.5% (19.9%)</td>
<td>24</td>
<td>26.0% (25.3%)</td>
</tr>
<tr>
<td></td>
<td>24.1% (23.9%)</td>
<td>22</td>
<td>21.4% (22.5%)</td>
</tr>
<tr>
<td>PS valence ratio</td>
<td>0.37 (0.29)</td>
<td>23</td>
<td>0.25 (0.25)</td>
</tr>
<tr>
<td></td>
<td>0.44 (0.41)</td>
<td>45</td>
<td>0.34 (0.39)</td>
</tr>
</tbody>
</table>

**Note:** SD = Standard deviation. PS/min = Private speech utterances per minute. PS% = Proportion (percentage) of total private speech utterances. *p < .10; *p < .05; **p < .01.
motivational private speech did not differ between conditions, showing a negative valence ratio in both groups.

On the fishing activity, as predicted, children in the playful context used more frequent imaginative private speech than children in the non-playful context ($d = .75$, medium effect size). Unexpectedly, children in the playful condition also used more frequent cognitive private speech ($d = .73$, medium effect size). No differences were found between conditions in terms of children’s proportions of various private speech categories. The emotional valence of motivational private speech did not differ between conditions, showing a negative valence ratio in both groups ($M = .37, SD = .29$ for playful condition; $M = .45, SD = .41$ for non-playful condition). On the puzzle activity, children in the playful condition used significantly more cognitive private speech in terms of both frequency ($d = .60$, medium effect size) and proportion ($d = .80$, large effect size). Children in the playful condition also used a higher proportion of metacognitive private speech ($d = .64$, medium effect size). Contrary to expectation, the emotional valence of motivational private speech did not differ between conditions.

**Relation between Private Speech and Mastery Motivation**

Another goal of this study was to investigate how children’s private speech related to their mastery motivation and its components. It was predicted that children’s mastery motivation would relate to their use of motivational private speech, although it was unclear whether this relation would be positive or negative. Children’s mastery motivation was expected to relate positively to their use of imaginative private speech. The study also aimed to explore which forms of private speech related most strongly to each component of mastery motivation. These relations were examined using Spearman rank correlations. Results for the fishing activity are displayed in Table 10. No formal corrections for the number of comparisons were used, but
informal calibration as discussed by Gelman, Hill and Yakima (2012) indicated that, for 36 comparisons at the .05 significance level, slightly less than two significant findings would be expected by chance. As evident in Table 10, six of 36 correlations were significant, suggesting that the significant relations found between mastery motivation and private speech were not likely due to chance alone.

Table 10

*Spearman correlations between private speech and overall mastery motivation, and mastery motivation components on fishing activity*

<table>
<thead>
<tr>
<th></th>
<th>Composite MM p value</th>
<th>Performance (possible fishing p value)</th>
<th>Persistence (impossible fishing p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private speech frequencies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total PS/min</td>
<td>.17</td>
<td>.271</td>
<td>.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.700</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.362</td>
</tr>
<tr>
<td>Cognitive PS/min</td>
<td>.27*</td>
<td>.070</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.808</td>
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<td></td>
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<td>.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.143</td>
</tr>
<tr>
<td>Motivational PS/min</td>
<td>.09</td>
<td>.574</td>
<td>-.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.266</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.28*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.079</td>
</tr>
<tr>
<td>Metacognitive PS/min</td>
<td>.19</td>
<td>.210</td>
<td>.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.140</td>
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<td>.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.293</td>
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<tr>
<td>Imaginative PS/min</td>
<td>.31*</td>
<td>.042</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.812</td>
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<td></td>
<td></td>
<td></td>
<td>.43**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.005</td>
</tr>
<tr>
<td>Internalized PS/min</td>
<td>.20</td>
<td>.181</td>
<td>.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.481</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.799</td>
</tr>
<tr>
<td>Private speech proportions</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive PS%</td>
<td>.13</td>
<td>.414</td>
<td>-.08</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.619</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.244</td>
</tr>
<tr>
<td>Motivational PS%</td>
<td>-.31*</td>
<td>.041</td>
<td>-.38*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.016</td>
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<td>.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.188</td>
</tr>
<tr>
<td>Metacognitive PS%</td>
<td>.11</td>
<td>.487</td>
<td>.38*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.018</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.08</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>.626</td>
</tr>
<tr>
<td></td>
<td>.22</td>
<td>.157</td>
<td>.03</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td>Imaginative PS%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalized PS%</td>
<td>.29+</td>
<td>.061</td>
<td>.17</td>
</tr>
<tr>
<td>PS valence ratio</td>
<td>.04</td>
<td>.799</td>
<td>-.07</td>
</tr>
</tbody>
</table>

*Note:* PS/min = Private speech utterances per minute. PS% = Proportion (percentage) of total private speech utterances. + p < .10; * p < .05; ** p < .01.

**Fishing activity.** On the fishing activity, as predicted, children’s overall mastery motivation was positively related to their frequency of imaginative private speech. Figure 5 displays a scatterplot of the positive relation between children’s ranks in overall mastery motivation and their ranks in frequency of imaginative private speech on the fishing activity. Children who ranked highly in the use of imaginative private speech also ranked highly in mastery motivation, while children who ranked low in imaginative private speech (using little or no imaginative private speech) also ranked low in mastery motivation.
Interestingly, children’s proportion of motivational private speech was found to be negatively related to overall mastery motivation. Figure 6 presents a scatterplot of the negative relation between children’s ranks in overall mastery motivation and their ranks in proportion of motivational private speech on the fishing activity. Children who ranked higher in their proportions of motivational private speech had lower ranks in overall mastery motivation.
Finally, children’s frequency of cognitive private speech \((p = 0.070)\) and their proportion of partially internalized private speech \((p = 0.061)\) showed positive marginal trends with composite mastery motivation on the fishing activity.

In addition, the relations between individual components of mastery motivation (performance and persistence) and performance-relevant and persistence-relevant private speech were explored. As per the study’s design, private speech used while catching the possible fish was considered relevant to children’s performance, while private speech used while attempting to catch the impossible fish was considered relevant to persistence. These two mastery motivation components were found to relate to different categories of private speech. Children’s performance on fishing was positively associated with their proportion of metacognitive private speech, but negatively related to their proportion of motivational private speech. Figure 7
presents a scatterplot of the positive relation between children’s ranks in performance and their ranks in proportion of metacognitive private speech on the fishing activity.

Figure 7. Relation between children’s ranks in performance and proportion of metacognitive private speech on fishing activity.

In contrast, Figure 8 presents a scatterplot of the negative relation between children’s ranks in performance and their ranks in proportion of motivational private speech on the fishing activity.
Children’s persistence, on the other hand, was positively correlated with both their frequency and proportion of imaginative private speech. This means that children who ranked high in imaginative private speech also ranked high in persistence on the most challenging portion of the fishing activity. Figure 9 shows a scatterplot of the positive relation between children’s ranks in persistence and their ranks in frequency of imaginative private speech on the fishing activity.
Figure 9. Relation between children’s ranks in persistence and frequency of imaginative private speech on fishing activity.

Similarly, Figure 10 displays a scatterplot of the positive relation between children’s ranks in persistence and their ranks in proportion of imaginative private speech on the fishing activity.
Persistence also showed a positive marginal trend with children’s frequency of motivational private speech \( (p = .079) \), and the emotional valence of that private speech \( (p = .085) \).

**Puzzle activity.** Results of the same analyses conducted for the puzzle activity are displayed in Table 11. Again, no formal corrections for the number of comparisons were used, but informal calibration indicated that for 36 comparisons at the .05 significance level slightly less than two significant findings might be expected by chance. As evident in Table 10, four of 36 correlations were significant, suggesting that significant relations between mastery motivation and private speech were not likely due to chance alone. Children’s overall mastery motivation on puzzles was positively related to their proportion of cognitive private speech and the valence of their motivational private speech.
Table 11

*Spearman correlations between private speech and overall mastery motivation, and mastery motivation components on puzzle activity*

<table>
<thead>
<tr>
<th></th>
<th>Composite MM value</th>
<th>Performance (barnyard puzzle) p</th>
<th>Performance (zoo puzzle) p</th>
<th>Independence (zoo puzzle) p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total PS/min</td>
<td>.01</td>
<td>−.17</td>
<td>.248</td>
<td>.19</td>
</tr>
<tr>
<td>Cognitive PS/min</td>
<td>.23</td>
<td>.126</td>
<td>.03</td>
<td>.871</td>
</tr>
<tr>
<td>Motivational PS/min</td>
<td>−.04</td>
<td>.791</td>
<td>−.18</td>
<td>.233</td>
</tr>
<tr>
<td>Metacognitive PS/min</td>
<td>−.09</td>
<td>.568</td>
<td>−.17</td>
<td>.262</td>
</tr>
<tr>
<td>Imaginative PS/min</td>
<td>−.08</td>
<td>.599</td>
<td>−.19</td>
<td>.210</td>
</tr>
<tr>
<td>Internalized PS/min</td>
<td>−.06</td>
<td>.685</td>
<td>−.02</td>
<td>.879</td>
</tr>
</tbody>
</table>

Private speech proportions

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive PS%</td>
<td>.32*</td>
<td>.041</td>
<td>.07</td>
<td>.647</td>
<td>.39*</td>
</tr>
<tr>
<td>Motivational PS%</td>
<td>−.06</td>
<td>.694</td>
<td>−.16</td>
<td>.323</td>
<td>−.05</td>
</tr>
<tr>
<td>Metacognitive PS%</td>
<td>−.21</td>
<td>.173</td>
<td>−.16</td>
<td>.326</td>
<td>−.02</td>
</tr>
<tr>
<td>Imaginative PS%</td>
<td>−.10</td>
<td>.529</td>
<td>−.19</td>
<td>.220</td>
<td>.01</td>
</tr>
<tr>
<td>Internalized PS%</td>
<td>−.11</td>
<td>.516</td>
<td>−.01</td>
<td>.958</td>
<td>.08</td>
</tr>
<tr>
<td>PS valence ratio</td>
<td>.41*</td>
<td>.019</td>
<td>.25</td>
<td>.215</td>
<td>.35</td>
</tr>
</tbody>
</table>

Note: MM = Mastery Motivation. PS/min = Private speech utterances per minute. PS% = Proportion (percentage) of total private speech utterances. * p < .05.
Figure 11 displays a scatterplot of the positive relation between children’s ranks in overall mastery motivation and their ranks in proportion of cognitive private speech on the puzzle activity.

![Graph showing scatterplot](image)

*Figure 11. Relation between children’s ranks in overall mastery motivation and proportion of cognitive private speech on puzzle activity.*

Similarly, Figure 12 shows a scatterplot of the positive relation between children’s ranks in overall mastery motivation and their ranks in emotional valence ratio of motivational private speech on the puzzle activity.
Figure 12. Relation between children’s ranks in overall mastery motivation and emotional valence ratio on puzzle activity.

The relations between individual components of mastery motivation (performance and independence) and performance-relevant and independence-relevant private speech were also explored. As per the study’s design, private speech used while catching completing the barnyard puzzles was considered relevant to performance, while private speech used while working on the zoo puzzle was considered relevant to independence. Unexpectedly, children’s performance on puzzles was not related to any private speech category. In contrast, children’s independence was positively correlated with both their frequency and proportion of cognitive private speech. This means that children who ranked high in cognitive private speech tended to work more independently on the challenging zoo puzzle. Figure 13 presents a scatterplot of the positive relation between children’s independence and their ranks in frequency of cognitive private speech on the puzzle activity.
Figure 13. Relation between children’s independence and frequency of cognitive private speech on puzzle activity.

Similarly, Figure 14 displays a scatterplot of the positive relation between children’s independence and their ranks in proportion of cognitive private speech on the puzzle activity.
Figure 14. Relation between children’s independence and proportion of cognitive private speech on puzzle activity.

**Bilinguals’ versus Monolinguals’ Private Speech**

To explore potential bilingual advantages in private speech, the developmental sophistication and diversity of functions for which bilinguals use private speech was compared to that of monolinguals. It was hypothesized that bilingual children would show greater developmental sophistication and functional diversity in their private speech than monolingual children in both playful and non-playful conditions. Developmental sophistication in private speech was measured through children’s frequency and proportion of partially internalized private speech. Diversity of private speech functions was measured via the number of distinct functional private speech categories that children used, summed across both activities. Functional private speech categories included cognitive, motivational, metacognitive, and imaginative private speech, but not partially internalized private speech, which is a category
based on the form that private speech takes. Table 12 presents ANCOVA (with age as the covariate) results for both conditions combined, as well as playful and non-playful conditions considered separately.

Table 12

*Estimated means and standard deviations of composite study variables (for both activities)*

*for bilinguals and monolinguals, with ANCOVA results (age controlled as a covariate)*

<table>
<thead>
<tr>
<th></th>
<th>Bilinguals</th>
<th></th>
<th></th>
<th>Monolinguals</th>
<th></th>
<th></th>
<th>F</th>
<th>p   value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>(SD)</td>
<td>n</td>
<td>Mean</td>
<td>(SD)</td>
<td>n</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Across conditions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalized PS/min</td>
<td>0.58</td>
<td>(0.52)</td>
<td>27</td>
<td>0.46</td>
<td>(0.49)</td>
<td>20</td>
<td>0.77</td>
<td>.385</td>
</tr>
<tr>
<td>Internalized PS%</td>
<td>26.8%</td>
<td>(21.3%)</td>
<td>26</td>
<td>19.8%</td>
<td>(22.0%)</td>
<td>20</td>
<td>1.42</td>
<td>.240</td>
</tr>
<tr>
<td>Distinct PS functions</td>
<td>5.03</td>
<td>(2.28)</td>
<td>27</td>
<td>5.70</td>
<td>(2.05)</td>
<td>20</td>
<td>1.03</td>
<td>.315</td>
</tr>
<tr>
<td>Non-Playful condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalized PS/min</td>
<td>0.53</td>
<td>(0.47)</td>
<td>14</td>
<td>0.36</td>
<td>(0.42)</td>
<td>9</td>
<td>0.75</td>
<td>.396</td>
</tr>
<tr>
<td>Internalized PS%</td>
<td>23.9%</td>
<td>(18.4%)</td>
<td>13</td>
<td>27.3%</td>
<td>(31.4%)</td>
<td>9</td>
<td>0.11</td>
<td>.740</td>
</tr>
<tr>
<td>Distinct PS functions</td>
<td>4.35</td>
<td>(2.16)</td>
<td>14</td>
<td>4.79</td>
<td>(2.37)</td>
<td>9</td>
<td>1.88</td>
<td>.669</td>
</tr>
<tr>
<td>Playful condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalized PS/min</td>
<td>0.66</td>
<td>(0.58)</td>
<td>13</td>
<td>0.49</td>
<td>(0.54)</td>
<td>11</td>
<td>0.82</td>
<td>.375</td>
</tr>
<tr>
<td>Internalized PS%</td>
<td>29.6%</td>
<td>(24.5%)</td>
<td>13</td>
<td>13.8%</td>
<td>(9.4%)</td>
<td>11</td>
<td>5.27*</td>
<td>.032</td>
</tr>
<tr>
<td>Distinct PS functions</td>
<td>5.92</td>
<td>(2.19)</td>
<td>13</td>
<td>6.28</td>
<td>(1.57)</td>
<td>11</td>
<td>2.03*</td>
<td>.657</td>
</tr>
</tbody>
</table>

Note: SD = Standard deviation. PS/min = Private speech utterances per minute. PS% = Proportion (percentage) of total private speech utterances. *p < .10; *p < .05; **p < .01.
Across both conditions combined, bilinguals and monolinguals demonstrated similar frequencies and proportions of partially internalized private speech, and a similar diversity of private speech functions. In the non-playful condition, children also used similar amounts of partially internalized private speech, and an equal diversity of private speech functions. In the playful condition, however, bilinguals used significantly higher proportions of partially internalized private speech than monolinguals ($d = .94$, large effect size). This supports the hypothesized bilingual advantage in developmental sophistication of private speech. Unexpectedly, however, this private speech advantage was only apparent under playful conditions. In the playful condition, as in the other conditions, bilinguals used an equal number of distinct private speech functions as monolinguals ($d = .97$, effect size). In sum, in the playful condition, bilinguals used more developmentally advanced (partially internalized) private speech, and an equal diversity of (fully externalized) private speech functions.
CHAPTER 7
Discussion and Implications

Vygotskian and self-determination theory suggests that children may become agentic and inspired, or disengaged and alienated, due in large part to the social and pedagogical conditions of their development. In the context of expanding U.S. preschool enrollment, and an ongoing decline in play-based pedagogy, the central aim of this study was to investigate the relative impact of playful and non-playful conditions on preschoolers’ private speech and mastery motivation. The playful and non-playful conditions were created by framing challenging fishing and puzzle activities as either sociodramatic play or work production, and simulating key social, pedagogical, and motivational features of common but contrasting preschool contexts, as identified in Stipek et al. (1992). The study set up this central investigation by first examining individual differences in children’s mastery motivation and private speech across activities, as well as the effects of specific activities on children’s mastery motivation and private speech. The study then assessed the impact of playful conditions on preschoolers’ mastery motivation, overall private speech, and use of various private speech categories. The study further investigated relations between children’s private speech and mastery motivation, including the relation of various private speech categories to individual components of mastery motivation. Finally, to explore potential bilingual advantages in private speech, a subgroups analysis compared the developmental sophistication and diversity of private speech functions used by bilingual and monolingual participants during challenging activities.

Individual Differences and Activity Effects

At present, relatively little is known about whether individual differences in children’s private speech remain stable from activity to activity. To the extent that private speech represents
a crystallization of a cohesive set of verbal mediation strategies that children have developed over time, it would be expected that children would be relatively consistent in their use of private speech from activity to activity. In the present study, while some consistency in private speech patterns across tasks was expected, it was also anticipated that children would strategically adapt their use of private speech functions to the motivational and mastery challenges of the activity at hand. Results indicated that children’s mastery motivation was not stable across activities, varying from the fishing to the puzzle activity. This finding accords with the view that the motivation of individuals is often domain-specific, task-specific, or activity-specific (Bong, 2001; Weiner, 1990). Children’s private speech showed moderate consistency across activities, and somewhat less consistency than was found in one of the few studies to investigate cross-task consistency, Winsler et al. (2003). The most stable categories were children’s frequency of total private speech, imaginative private speech, and children’s frequency and proportion of partially internalized private speech; notably, these same categories were also found to be stable across activities in Winsler et al. (2003). Interestingly, children’s motivational private speech and the emotional valence of that motivational speech were the most variable between activities, perhaps reflecting a certain domain specificity in motivational private speech, similar to the posited domain specificity of motivation. In other words, as children’s motivation levels vary between activities, their use of motivational private speech may fluctuate accordingly. Given the predominantly negative relation between mastery motivation and motivational private speech in this study (the only private speech variable to show such a relation), it appears that children may have employed motivational private speech in an unsuccessful effort to compensate for lower motivation levels. In other words, children may have used more motivational private speech in an effort to upregulate low levels of motivation, whether these low motivation levels were due to
the non-playful condition (e.g., non-playful), the nature of the activity itself, or a combination of these factors. Another possibility is that the overall negative valence ratio within children’s motivational private speech made the category of motivational private speech generally unfavorable for mastery motivation. Finally, it is worth noting that the valence of motivational private speech showed a positive relation to mastery motivation more often than motivational speech itself. Thus, children’s use of a positive, encouraging emotional timbre in their self-talk may be more important than using the category of motivational private speech per se. Further research is needed to sort out these possibilities.

To examine potential activity-specific effects on private speech, individual children’s mean levels of private speech use were compared between activities. Results indicated key private speech differences across activities that appear related to the unique demands of each activity. The fishing activity was found to elicit more motivational and imaginative private speech, while the puzzle activity elicited higher levels of cognitive private speech. Given this finding, it appears plausible that children used more imaginative private speech on the fishing activity because, relative to the puzzle activity, fishing was more “playful” in its materials and setup (e.g., colorful fish, fishing rod and bucket, the game-like fun of catching the magnetized fish). Additionally, the fishing activity’s demands for active physical persistence (children generally stood and moved around while fishing) and the insoluble challenge of the impossible fish likely prompted more emotional/motivation self-talk than did the more sedentary, cognitively-oriented puzzle activity, which was conducted at a table while seated. Similarly, it seems probable that children used more cognitive private speech during puzzles than fishing because the functions of thinking, planning, and guiding strategic behavior were more relevant to
deciphering, organizing, and connecting the puzzle pieces that they were to activity of physically catching the fish.

Overall, more activity-specific patterns in the use of various private speech categories were found in the present study than in Winsler et al. (2003), which conducted a similar analysis using a different coding scheme. Past studies have shown that the amount of private speech that children use can vary by indoor/outdoor context (Winsler, Carlton & Barry, 2000), and the goal-oriented nature and structure of the activity (Winsler & Diaz, 1995; Krafft & Berk, 1998). In addition, the amount and type (e.g. self-regulatory) of private speech that children use has been found to vary by task difficulty (Frauenglass & Diaz, 1985). Rarely, however, have past studies investigated various private speech functions (i.e. cognitive, motivational, metacognitive, imaginative) in relation to different activities and their corresponding demands. The present study indicates that particular private speech functions (i.e. cognition or motivation) may be elicited in different degrees by diverse activities with contrasting demands (i.e. fishing and puzzles).

**Effects of Conditions on Mastery Motivation**

In terms of the motivational impact of playful and non-playful conditions, results indicated that, across both activities, children in the playful context displayed significantly higher overall levels of mastery motivation (a composite of performance, persistence, challenge seeking, and independence) than children in the non-playful context. For both activities combined, children in the playful context scored marginally higher on the performance composite, and significantly higher on the non-performance motivation composite (persistence, challenge seeking, and independence). These trends were similar within each activity. Children in the playful context demonstrated better persistence and performance on the fishing activity,
and greater challenge seeking/independence on the puzzle activity, though children’s performance on puzzles did not differ between conditions. In sum, results indicate that the playful context was superior for children’s mastery motivation, especially its non-performance motivation components. This suggests that a playful context emphasizing intrinsic motivation and prosocial relatedness is more beneficial for preschoolers’ mastery motivation than a non-playful context emphasizing individual work production and extrinsic motivation. This outcome adds experimental support to naturalistic findings on the motivational advantages of play-like settings over business-like settings in early childhood education (Stipek et al., 1995; 1998), and argues for a beneficial causal impact of play on motivation. More broadly, this finding supports a Vygotskian perspective on play as a powerful activity for children’s development of agency and volition, and adds methodologically rigorous support to post-Vygotskian studies suggesting that children display improved performance in pretend play scenarios (Istomina, 1975; Ivanova, 2000; Manuilenko, 1975).

The study’s mastery motivation results also appear to be consistent with self-determination theory (SDT) on the differential effects of contexts promoting intrinsic (autonomous) motivation and extrinsic (controlled) motivation. For example, a meta-analysis by Deci, Koestner and Ryan (1999) found that expected tangible rewards for task engagement or performance reliably undermine motivation, as do evaluations and directives perceived as externally controlling. In contrast, the combination of prosocial and intrinsic motivation was found to predict enhanced performance and persistence in adult work situations (Grant, 2008). Extrapolated over time, it is conceivable that children’s activity and associated private speech within these disparate pedagogical and motivational contexts could lead to the regular experience of autonomous (intrinsic) motivation and internalization of a mastery orientation, or alternately,
to the recurrent experience of controlled (extrinsic) motivation and internalization of a performance orientation. While most SDT research has been conducted with adults, this study adds to the far smaller empirical literature that relates concepts from SDT to the motivational development of young children.

Finally, the finding of children’s greater persistence in the playful condition during the fishing activity also resonates with the results from a study dubbed the “Batman Effect” (White et al., 2016). This study found that four-year-old and six-year-old children who were encouraged to impersonate a character who was “really good at working hard” (i.e. Batman, Bob the Builder, Rapunzel, or Dora the Explorer) persisted significantly longer on a boring, repetitive task than children who were merely instructed to think about their own thoughts and feelings from a first-person perspective. The study conceptualized the finding as based upon the beneficial psychological effects of self-distancing, or taking an outsider’s perspective on one’s own situation. In line with this interpretation, there was another condition in which children were instructed to think about themselves from a third-person perspective, and to periodically ask themselves the question, “Is [child’s name] working hard?” Children in this condition persisted longer than the first-person condition (“Am I working hard?”), but not as long as the exemplar condition (“Is Batman working hard?”). A second study based on a similar paradigm found that self-distancing from first-person to third-person to role-playing a character progressively improved children’s performance on classic “cool” executive functioning (EF) tasks that did not involve emotionally charged stimuli.

While children’s enhanced persistence on a repetitive task may owe something to psychologically distancing oneself from boredom and frustration, it is also possible that the role play condition, in which children donned an item of clothing to represent their character (e.g.
Batman’s cape, Dora’s backpack, or Rapunzel’s crown), encouraged higher levels of motivation among children, which led to their increased persistence. As discussed here, play involves children taking on meaningful social roles and acting out scenarios “as if” they were the character in question. Children are able to extend their typical capabilities in play, as if they are trying to “live up” to the diligence, competence, and courage of Batman or Dora the Explorer. Thus, while play may sometimes involve gaining beneficial psychological distance from one’s own negative emotions (e.g. frustration, boredom) during an activity, play also offers the possibility of embracing positive emotions about the imaginary scenario and character that one is playing. If the imaginary scenario and social roles that children take on during play are meaningful ones, this is likely to amplifying children’s agency and motivation as they engage in play. Such enhanced motivation is likely to not only improve persistence, but also children’s performance, challenge-seeking and independence during challenging activities, as found in the present study. Thus, when play is considered in the full scope of its motivating power, gaining psychological distance from oneself appears as only one limited aspect of the playful situation. Entering or creating an imaginary scenario with meaningful roles and prosocial themes, in combination with the motivationally beneficial self-talk that it seems to elicit, may offer a variety of cognitive, emotional, and developmental benefits that go beyond simple self-distancing.

Effects of Conditions on Overall Private Speech

In terms of impact of playful and non-playful conditions on children’s total private speech, for the two activities combined, children in the playful context used significantly more frequent total private speech that children in the non-playful context. Relative to the children in the non-playful context, children in the playful context tended to use higher rates of overall private speech during the most difficult portions of each activity (the impossible fish and the zoo
puzzle). This suggests that children in the playful condition may have used increased private speech to assist themselves in surmounting the most difficult portions of each activity. The finding of more frequent private speech in a playful context lends important experimental support to Krafft and Berk’s (1998) naturalistic finding that preschoolers used more private speech during play than non-play tasks. This finding was made possible because the present study disentangled the confounds evident in Winsler and Diaz (1995) and Krafft and Berk (1998). As discussed earlier, these confounds between open-ended and playful activities were overcome by creating close-ended, goal-oriented activities that were then placed within a playful versus a non-playful context. After overcoming these confounds, the more frequent private speech found in the present study’s playful context suggests that the more frequent use of private speech in playful contexts is due to factors other than the open-ended nature of play, which was the explanation for this effect offered by Krafft and Berk. Because play in the present study had a close-ended goal (to catch all of the fish), some other aspect or aspects of the play scenario must have played the critical role in encouraging more frequent private speech. The motivating qualities of pretend role-play and playful prosociality appear to be good candidates for these causal factors.

Effects of Conditions on Private Speech Categories

In terms of the impact of playful and non-playful conditions on specific categories of private speech, for both activities combined children in the playful context used more frequent imaginative private speech, and a higher frequency and proportion of cognitive private speech. These overall patterns were fairly similar within each activity. On the fishing activity, children in the playful context used more frequent cognitive and imaginative private speech. On the puzzle activity, children in the playful context used higher frequencies and proportions of cognitive
private speech, but also higher proportions of metacognitive private speech. For children in the playful context, the use of imaginative private speech signified that children were entering and operating within the imaginary scenario that was presented to them (e.g., being a fisherwoman who was catching fish to share with the family), or were creating new imaginary scenarios of their own. This appears to be a clear example of children appropriating playful elements from their activity context and/or transforming them through private speech to amplify their playful, motivating qualities. Notably, children in the non-playful context also used some imaginative private speech to create imaginary scenarios themselves, or to address inanimate objects (e.g., various fish) as if they were living beings (e.g., one boy said to the fish, “Why you not sticking on my rod?”).

While enhanced use of imaginative private speech was anticipated in the playful condition, children also used more frequent cognitive private speech in the playful context, which was not expected. How might we explain this? One possibility is through expectancy-value theory, which predicts greater strategy use by more motivated children (Pintrich & DeGroot, 1990). Based on this premise, we would expect that children in the more highly motivating playful context to rely more heavily on cognitive forms of private speech to conceive, plan, and direct their strategic behavior. Perhaps a deeper explanation, however, comes from the account of the dialectical connection between play and cognition, or imagination and thought that was given by Vygotsky in Thought and Language (1934/1986). Building on Lenin’s (1915/1961) critique of idealism, Vygotsky points out that all concepts (e.g., “table”) refer to a class of things that is generalized and abstracted from reality, and thus any general concept already contains “a piece of fantasy” (p. 39). By transforming abstract concepts and ideas, humans can create imaginary scenarios and counterfactual fantasy worlds, which are the
hallmark of play. And yet, such imagination is deeply intertwined with the cognition of reality, and in a sense are two sides of the same conceptual coin. As Vygotsky puts it, the co-development of fantasy and thought entails “the flight of imagination on the one hand, and its deeper reflection upon real life on the other” (p. 39). Viewed in this light, the finding that children in the playful condition simultaneously used more cognitive and imaginative private speech may indicate that children were deeply cognizing the nature of the challenging activities and the best strategies to engage with them, as well as playing with imaginative (and motivating) possibilities that extended beyond the immediate task that confronted them. Thus, playful scenarios may benefit children’s use of verbal mediation for cognitive as well as playful, imaginative purposes.

Contrary to expectation, the emotional valence ratio of positive to negative motivational utterances for both activities combined did not differ between conditions. As reported earlier, both groups had valence ratios that were predominantly negative for both activities combined (.37 for the playful condition, and .45 for the non-playful condition). This overall negative valence for both conditions may be because children tended to use more motivational private speech when they were struggling with the activities, and thus most motivational private speech took on a negative valence. Thus, it appears that the emotionally positive overtones of the playful context did not imbue children’s motivational private speech with greater emotional positivity than the non-playful context. By merely coding for emotional valence in motivational private speech, however, this study may have overlooked the positive emotional valence generally present in imaginative private speech. As Russ (2014) pointed out, most affect in play is overtly positive, and even ostensibly “negative” emotions are part of the pretend scenario, are generally enjoyable to the child, and appear to have an actual valence that is more positive than negative.
Considering this point, in order to get a more accurate overall picture of emotional valence in private speech, future work might code certain subcategories of imaginative private speech as containing a positive valence. Analyzing emotional valence in such an “expanded” manner may reveal underlying advantages of playful contexts for generating more emotionally positive self-talk among young children.

**Private Speech Categories and Mastery Motivation**

Another major goal of this study was to explore the relation between children’s private speech and mastery motivation. As hypothesized, children’s mastery motivation and its individual components were found to relate to different categories of private speech within each activity. On the fishing activity, children’s composite mastery motivation related positively to their frequency of imaginative private speech, but negatively to their proportion of motivational private speech. Interestingly, this suggests that the imaginative and prosocial qualities of imaginative private speech may have been more beneficial to children’s motivation than the use of direct motivational private speech. Breaking mastery motivation into its components on the fishing activity allowed examination of the relation between the two components (performance and persistence), and private speech that was relevant to each component. This analysis revealed that children’s fishing performance was positively related to their proportion of metacognitive private speech, but negatively related to their proportion of motivational private speech. This suggests the possibility that children’s use of metacognitive private speech to reflect on the goal-oriented process of fishing (monitoring, correcting errors, and recognizing solutions) may have improved the accuracy of their performance. In contrast, children’s use of motivational private speech may have actually hindered their performance; an alternative possibility, however, is that children used more motivational private speech such as negative emotional reactions when they
were having difficulty catching the fish. Meanwhile, children’s level of persistence on the impossible fish was positively related to their frequency and proportion of imaginative private speech, and showed positive marginal trends with children’s frequency of motivational private speech, and the emotional valence of that motivational speech. In using imaginative private speech, children invoked the prosocial themes and motivating qualities of imaginary scenarios, which likely helped them to transcend immediate difficulties or frustrations, and to persist in pursuing the impossible fish. In addition, using frequent motivational private speech and maintaining a positive emotional valence in motivational speech also appeared beneficial to children’s ability to persist on a challenging activity.

On the puzzle activity, in contrast, children’s overall mastery motivation was found to relate positively to their proportion of cognitive private speech, as well as the emotional valence of their motivational private speech. This suggests that the planning, guiding, and strategic functions involved in cognitive private speech may enhanced children’s motivation. In addition, while the amount of motivational private speech that children used did not appear to be important, maintaining a positive emotional valence in that motivational speech was associated with higher motivation. Breaking mastery motivation into its components on the puzzle activity allowed examination of the relation between two components (performance and independence), and private speech that was relevant to each. This analysis revealed that children’s performance on the barnyard puzzles was not significantly related to any private speech variables. In contrast, children’s independence in attempting the zoo puzzle was positively related to their frequency and proportion of cognitive private speech. While the lack of relation between children’s private speech and performance on puzzles is surprising, the connection between children’s cognitive private speech and their enhanced independence on the puzzle activity suggests that the self-
guiding and strategic functions involved in cognitive speech may have facilitated children’s independent thinking and self-regulated work on the cognitively demanding zoo puzzle.

**Potential Bilingual Advantages in Private Speech**

To explore potential bilingual advantages in private speech, the developmental sophistication and diversity of functions for which bilinguals used private speech was compared to that of monolinguals. Based upon the author’s prior research (Sawyer 2016), it was hypothesized that bilingual children would show advantages in both the developmental level and diversity of functions for which they used private speech across conditions. Unexpectedly, no differences were found between bilinguals and monolinguals for both conditions combined. However, in the playful condition bilinguals used higher proportions of partially internalized private speech than monolinguals. This appears to support the hypothesized bilingual advantage in developmental sophistication of private speech, as partially internalized private speech occurs in greater degrees among older and/or more developmentally advanced children, as well as among children who are more advanced on a given activity (Berk & Spuhl, 1995; Duncan & Pratt, 1997; Winsler, 2009). At the same time, however, bilingual children in the playful condition used an equal number of distinct (fully externalized) private speech functions as monolinguals in the same playful condition.

Thus, in regard to potential bilingual advantages in private speech, greater internalization was found among bilinguals, but not greater diversity of private speech functions. These results suggest that, in the playful context, bilinguals had a greater tendency than monolinguals to carry out various private speech functions in a partially internalized, rather than fully externalized manner. However, it is possible that bilinguals’ greater proportions of partially internalized private speech obscure their use of a greater diversity of functions. This is because when a
function (e.g., cognitive, motivational, metacognitive, playful) is carried out in the abbreviated phonological, semantic, or grammatical form of partially internalized speech, it cannot be simultaneously categorized according to its actual function for the child. Instead, this abbreviated utterance is categorized according to its partially internalized form. In other words, it is possible that bilinguals may have used a greater variety of functions through private speech, but merely did so in partially internalized form.

In any case, the finding more prolific use of this developmentally sophisticated speech by bilinguals appears to constitute an advantage in verbal mediation during challenging activities. This is premised on the idea that increased use of partially internalized private speech indicates greater development of speech internalization, and is associated with more advanced stages in the development of verbal thinking and verbal mediation of cognition (Vygotsky, 1934/1964). Partially internalized private speech has also been linked to better performance on various EF tasks (Alarcón-Rubio, Sánchez-Medina, & Prieto-García, 2014; Al-Namlah et al., 2006; Fernyhough & Fradley, 2005), which underscores its link to developmentally advanced cognition. At present, it is unclear why this pattern of potential advantage was only evident among bilinguals in the playful condition, but it may be speculated that the highly motivating playful context facilitated the emergence of this unique pattern in bilingual private speech. Based on this suggestive, though far from conclusive, evidence on the unique properties of bilingual private speech, the case seems persuasive for continuing to pursue the verbal mediation hypothesis, which posits enhanced development of verbal mediation among bilinguals. While a variety of methods should be used to further explore this hypothesis, examining the private speech of bilinguals appears to be a promising avenue for observing potential bilingual advantages in verbal mediation. Grounded in the empirically supported and theoretically
prominent Vygotskian position, the verbal mediation hypothesis has the added advantage of pointing the way to a methodology based in examining developmental processes as opposed to focusing only on cognitive outcomes (Sawyer, 2016). Guided by this hypothesis, research into bilingual private speech can potentially make a valuable contribution to outlining the contours of bilingual cognitive advantages, as well as helping to explain the causal processes implicated in their development.

**A Two-Sided Mirror**

Vygotsky (1934/1986) employed the metaphor of private speech as a two-sided mirror, one side reflecting a child’s history of sociocultural interaction, and the other reflecting the child’s current and future capacity for self-guidance in activity. One side of this mirror involves children’s ongoing developmental internalization of the social and linguistic activity in which they engage. Suggestions of this long-term internalization process were offered by a secondary aspect of this study, which examined the relation of children’s age to their private speech. As expected based on Vygotskian theory of internalization, older children used a higher frequency and proportion of partially internalized private speech than younger children. In addition, older children also used lower proportions of motivational private speech than younger children. Taken together, these findings suggest that older children had already internalized (or partially internalized) a greater degree of motivational private speech than the younger children, who were more likely to use motivational private speech in its fully “externalized” and audible form. Thus, this side of Vygotsky’s mirror represented the historical product, and continuing process, of children’s active internalization of sociocultural patterns of motivated activity.

Furthermore, children demonstrated the simultaneous double-sided nature of private speech, as the preschoolers simultaneously appropriated and transformed motivational elements
of their pedagogical context and actively mediated their motivation within that context. Results suggest that the playful context led children to amplify their use of private speech in general, and in particular on the most challenging parts of activities. In addition, the playful condition appeared to promote motivationally beneficial forms of private speech during specific activities to which they were especially well suited. On the fishing activity, for instance, children in the playful condition used significantly more imaginative private speech than children in the non-playful condition, and imaginative private speech was positively correlated with mastery motivation on fishing. Children’s imaginative private speech may have helped them overcome frustration while fishing by agentically entering and transforming imaginary play scenarios. One child, for example, upon encountering difficulty in catching the impossible fish, used the following imaginative private speech: “My dinosaur Steggy is coming. He’s gonna suck up all the water. Then I’ll get those fish!” Based on anecdotal observation, this playful utterance seemed to help the child overcome frustration and persist his quest to catch the elusive last fish. Thus, the playful context seemed to promote a type of playful self-talk that was particularly useful for the fishing task, which required overcoming frustration in a dynamic and ongoing manner in order to persist in the quest to capture the most challenging fish.

Similarly, on the puzzle activity, children in the playful condition used significantly more cognitive private speech than children in the non-playful condition, and cognitive private speech was positively correlated with mastery motivation, as well as its component of independence in problem solving. This suggests that the playful condition once again encouraged the use of a cognitive self-talk tool which was especially compatible with the planning, strategy, and general cognitive demands of the activity at hand, and which allowed children to work independently in their agentic and motivated attempts at mastering the most challenging zoo puzzle on their own.
In sum, this suggests that playful contexts encourage children to use verbal mediation to motivate themselves in effective and activity-specific ways.

**Methodological Contributions**

The present study represents an initial foray into considering how distinct pedagogical contexts and the private speech that children use within those contexts may combine in dynamic ways to enhance or diminish motivation. Using this framework, future larger-scale studies might investigate private speech as potentially mediating or moderating the effects of playful and non-playful contexts on preschoolers’ motivation. In terms of coding private speech, a newly synthesized coding scheme was developed in this study based on the work of Berk (1986), Chiu and Alexander (2000), de Dios and Montero (2003), and Atencio (2003). This new coding scheme has the advantage of combining developmental aspects of private speech coded by form (partially internalized private speech), as well as functions of private speech coded by semantic content (cognitive, motivational, metacognitive, and imaginative private speech). Finally, the coding scheme also includes an emotional valence dimension, which has been coded in work self-talk in sport and clinical psychology, but rarely used to analyze children’s private speech.

The addition of the new category of imaginative private speech to the coding scheme helped to capture children’s differential use of playful speech in each condition, as well as its positive relation with mastery motivation and persistence on the fishing activity. Although widely-used coding schemes (e.g., Berk, 1986) classify playful forms of private speech, such as speech addressed to imaginary others, as “task irrelevant,” the findings of this study suggest otherwise. Rather, in certain contexts, playful, imaginative forms of private speech may instead reflect high levels of agency and creative, active engagement. This suggests that the dichotomy between play and “goal-directed tasks” may not be applicable to situations in which children are
pursuing goal-directed tasks within playful contexts, as in the present study. Furthermore, sociodramatic play itself may be seen as a goal-directed but open-ended activity.

Thus, rather than distracting children from the task at hand, imaginative private speech that is elicited by playful contexts may expand possibilities for action, and deepen children’s commitment to the activity by embracing the meaningful roles and prosocial themes that are typically inherent in sociodramatic play. For instance, one child in the playful condition embraced his role from the pretend scenario as an “animal helper” who was helping return the lost barnyard animals to their farming family. As he put together the puzzle of the family’s lost chicken, he smiled and said, “Wait - the family sees their chicken coming back!” Imaginative private speech also seemed to deepen the will and focus of children in the non-playful condition, such as the girl who said to the chicken in the puzzle, “Please, let me find your beak.” Higher levels of imaginative private speech may also indicate that children are engaging in enhanced creative thinking, which self-determination theory (SDT) predicts to be evident in highly motivated children. In addition, adding a coding dimension to analyze the emotional valence of motivational private speech uncovered relations between children’s ratio of positively valenced utterances and mastery motivation on the puzzle activity, as well as persistence on the fishing activity. Although rarely coded in the analysis of children’s private speech to date, the connections with mastery motivation found here suggest that valence is a motivationally relevant dimension of private speech that warrants further investigation.

As for statistical analysis, Spearman rank correlations were used in this study to analyze the relations between private speech and mastery motivation. Though Pearson correlations have been employed more frequently in private speech research, Spearman correlations may be more appropriate, as private speech utterances are a count variable, and thus highly likely to be
positively skewed. By focusing on relative ranks rather than absolute numbers, Spearman correlations can reduce bias associated with the positive skew and outliers that are common in private speech measures. In terms of study design, the use of an insoluble task on the fishing activity proved to be an effective way of measuring children’s time of persistence in attempting to catch the impossible fish. In past research, children have often received lower ratings on persistence when they quickly solved a task; thus, high performance resulted in low persistence scores. The present study avoided this confound by clearly separating performance (on catchable fish) from persistence (on the impossible fish). The use of an insoluble task also elicited relatively frequent private speech, likely because it presented a high level of challenge. For these reasons, the use of insoluble tasks is recommended in future studies of children’s private speech and motivation. In terms of analysis, separating performance components from other indicators of mastery motivation (e.g., challenge seeking, persistence, independence) also proved to be methodologically useful, as the playful context was found to have relatively more benefits for non-performance motivation components than performance components of mastery motivation.

**Limitations and Future Directions**

One limitation of the present study is that the relative impact of framing an activity as play versus work production cannot be disentangled from the influence of attendant intrinsic and extrinsic motivational characteristics. The study intentionally simulated empirically co-occurring motivational aspects of playful and non-playful (business-like) preschool settings, but it remains to be seen whether one of these dimensions has a more powerful influence on private speech and mastery motivation, or whether there is a holistic effect of both dimensions. In addition, concurrent correlations between private speech and mastery motivation do not indicate a causal direction. In other words, it is possible that using certain types of private speech enhanced (or
diminished) children’s mastery motivation, but also possible that different levels of mastery
motivation among children catalyzed certain types of private speech. Most likely, there is a
dialectical, reciprocal relation between the two, as suggested by Chiu and Alexander (2000).
Studies manipulating children’s use of private speech through articulatory suppression do
suggest a causal influence of private speech on motivation (de Dios & Montero, 2003), but
studies directly manipulating motivation to examine effects on private speech have not been
conducted. In sum, potential reciprocal relations between private speech and motivation remain
to be explored. Furthermore, children’s overall frequency of private speech has often found to be
inconsistently correlated with task performance on a global level, though it is often related to
performance when examined on a more microgenetic, item-by-item level (Winsler, 2009). Such
a microgenetic analysis of private speech utterances in relation to performance or motivation
could be fruitfully conducted in future work.

Sample size is also a limitation of this study. With conventional power assumptions
(Cohen, 1992), the sample size was sufficient to reveal differences between the playful and non-
playful conditions with medium to large effect sizes. However, some small or medium effect
sizes of the playful versus non-playful condition or relations between private speech and
motivation may have escaped detection. In planning the sample size, there were few past studies
from which predicted effect sizes could be calculated. The study with the closest features to the
present study (Krafft & Berk, 1998) compared children’s private speech in play-based and non-
play-based preschools, finding large to very large effect sizes on key private speech variables.
Nevertheless, future larger-scale studies would further bolster the present results.

Future research can continue to investigate preschoolers’ private speech and motivation
in pedagogical contexts using new activities with different cognitive, emotional, or physical
demands. In addition, collecting data on children’s preschool classroom quality (e.g., ECERS scores) with respect to play and language use might reveal some interesting relations with children’s private speech. Finally, the bilingual versus monolingual private speech comparison in this study was limited by a lack of language proficiency data for bilinguals. The Home Language Identification Survey collected useful information about parents’ views on what languages the child could speak and understand, as well as patterns of language use with family members, thus allowing a rough categorization of children as bilinguals or monolinguals. The survey did not, however, collect precise data on children’s language proficiency in English or their other language(s), and no direct assessments of children’s proficiency were conducted in any of the 14 different home languages that parents reported. This is significant because past studies of bilingual advantage suggest that balanced bilinguals who possess relatively equal proficiency in two languages, and who use both languages regularly, are more likely to demonstrate bilingual cognitive advantages than less balanced bilinguals (Adesope, Lavin, Thompson, & Ungerleider, 2010; Yow & Li, 2015). Yet it was not possible to identify such balanced bilinguals in this study. The vast number of distinct languages spoken by participants and their families in metropolitan areas naturally complicates such an undertaking, but future studies of bilingual private speech may benefit from studying bilinguals who speak a single language (e.g., Spanish) that may be more feasible to directly assess in terms of proficiency.

Ultimately, the most substantial limitation of this study may be that the playful context created here does not reflect the full scope of genuine sociodramatic play. In naturalistic settings, sociodramatic play is typically freely-initiated, open-ended, and often involves multiple play partners. In this study, to draw a clear comparison between playful and non-playful conditions on the same activities without altering their basic structure, the playful scenarios were initiated by
the experimenter, featured a clear end goal, and was performed individually. Given that sociodramatic play was represented here in such attenuated form, the enhancement of mastery motivation and private speech in the playful context is even more striking. We might reasonably expect the longitudinal impact of naturalistic play-like and business-like settings on children’s developing motivational orientations to be even greater and longer lasting. This underscores the importance of widely promoting play-based and playful pedagogy in preschool settings.

**Pedagogical and Policy Implications**

The findings discussed here support the use of playful pedagogical contexts for promoting bilingual and monolingual preschoolers’ motivational development, as well as encouraging motivationally beneficial forms of private speech. Children’s enhanced mastery motivation and private speech in the playful condition illustrates Vygotsky’s (1933/1967) assertion that, during play, children perform “a head taller” than their typical levels in non-play activity, and is in accord with the neo-Vygotskian conception of play as the leading activity for the development of preschool age children. The findings suggest that situating an educational activity within a playful pretend scenario is highly meaningful and motivating to young children, and encourages enhanced use of self-talk during these activities. While preschoolers were the focus of this study, it is likely that the benefits of playful and play-centered education apply to children throughout elementary school and perhaps beyond.

In terms of recent educational policy, high-stakes testing and accountability have eroded early childhood play and shifted the educational climate toward a results-oriented focus on work production. However, the experimental evidence presented here aligns with naturalistic studies (Stipek et al., 1995; 1998) that highlight the need for radical change in the opposite direction. Based on these findings, early childhood activities and settings that incorporate sociodramatic
play, intrinsic motivation, and prosocial relatedness are expected to benefit children’s motivational development more than business-like settings emphasizing individual work production and extrinsic motivation. Crucially, the type of play featured and promoted in early childhood settings should be primarily sociodramatic. That is, play should involve children planning and playing out rich imaginary scenarios in which children take on a variety of social roles, and in which meaningful sociocultural themes are enacted. While other forms of play such as physical play, sports, board games, and manipulatory play with blocks and other toys are no doubt also beneficial to children’s development, there is no substitute for sociodramatic play, the developmentally leading activity from a Vygotskian perspective. Sociodramatic play should be extensive and central within early education. Play-based and playful learning approaches such as *Tools of the Mind* (Bodrova & Leong, 2009) and those outlined in Hirsh-Pasek et al. (2008) offer a few examples that seem to embody some of these motivationally advantageous elements.

The present study builds on work (reviewed in Atencio & Montero, 2009) suggesting that private speech provides a window not only into children’s cognitive processes, but into motivational processes as well. Thus, educators who listen carefully to children’s private speech are likely to gain insight into children’s typical motivational orientations, as well as how children navigate various pedagogical and motivational contexts. Teachers may encourage students’ motivational development by modeling and encouraging forms of private speech that are particularly relevant to mastery motivation and its components. In this way, teachers would provide relevant cultural tools that children can imitate, appropriate, and use for their own motivational ends. As identified in this study, these forms of private speech include cognitive private speech (related to independence), metacognitive private speech (related to performance), and imaginative private speech (related to persistence). Of course, it must be remembered that
the most beneficial forms of private speech will likely differ by the type of activity (e.g., fishing vs. puzzles) in which children are engaged. Further examining activity-specific effects on private speech will help to illuminate the ways in which different activities may call for different forms of private speech to mediate performance and motivation within those activities.

Interestingly, the use of motivational private speech showed inconsistent relationships with mastery motivation, and was sometimes negatively related to motivation. Thus, it appears that the emotional valence of motivational speech, rather than the quantity of motivational speech, may be the more critical factor. Thus, it may be beneficial to model and support emotionally positive forms of motivational self-talk among children. These emotionally positive forms of self-talk may include private speech in which children encourage themselves, express positive emotions, and make positive evaluations of themselves and the activities in which they are engaging. Taken as a whole, this study suggests that applying these pedagogical approaches might promote greater enjoyment and engagement in learning among preschoolers, and enhanced development of motivation and agency in early childhood.

Finally, the present finding of bilingual advantages in partially internalized private speech, especially if backed up by further research, adds another good reason to support the expansion of early bilingual education, including dual-language immersion programs for otherwise monolingual children in the U.S. Furthermore, if playful contexts are particularly efficacious in promoting developmentally advanced private speech or a diversity of private speech functions among bilinguals, then infusing play-based approaches into bilingual pedagogy may prove particularly beneficial. In sum, the systemic educational recommendations in line with this research include policy shifts to support play-based education, bilingual education, and
the promotion of linguistic diversity, all of which have been undermined in recent educational and social policy.

**Conclusion**

Viewed through a broad lens, the research conducted here suggests that specific sociocultural factors and specific pedagogical practices may have substantial impact on children’s motivation, especially their desire, energy, and agency to master challenging activities. Although many prominent schools of psychology, including self-determination theory (SDT), conceptualize motivation as stemming from innate drives or tendencies to explore and master the environment, the power of sociocultural influences on children’s motivation over the short term, as evident in this study, suggests that motivation has a deeper, fundamentally social source. Playful, prosocial pedagogical activities, in combination with the internalization of motivated sociocultural practices through private speech, appear capable of contributing strongly to children’s development of agency, and their desire to learn by taking on challenges and mastering life activities. The present work further suggests that the internalization of social speech and cultural activity, with private speech as a transformative link in that internalization, has an intimate connection not only to cognitive development, but also children’s development of motivation and agency. In particular, the sociocultural activity and experience of bilingual development appears to have ramifications for private speech, and this internalization process more generally. The Vygotskian-inspired verbal mediation hypothesis suggests that, by socially interacting in two languages, young bilinguals develop enhanced domain-general verbal mediation. This study found that, indeed, bilinguals used private speech at a more advanced stage of internalization than monolinguals as they tried to master challenges under playful
conditions, which suggests the need for expanded research into possible bilingual private speech advantages.

Extrapolating such sociocultural activity over the entire sweep of childhood and beyond reveals a picture of development of motivation as a fundamentally social process. From diverse sociocultural sources, children actively construct and co-construct their own agency through meaningful activities and prosocial relationships, with the practical goal of mastering and transforming the world around them. Thus, children’s individual agency and subjectivity arise and emerge through transformative, collaborative activity grounded in these sociocultural wellsprings. Viewed in this light, educational settings, as central sociocultural sites of children’s development, may facilitate the growth of emotionally positive and engaged (mastery) orientations or emotionally negative and alienated (performance) orientations as children develop. Given the far-reaching developmental, educational, and mental health ramifications of children’s motivational orientations, the present research makes a case for the transformation of education along lines that will place imagination, creativity, and play at the heart of children’s educational activity. In particular, schools should promote the flourishing of sociodramatic play, in which children create, enter, and transform imaginary scenarios, taking on characters, social roles, and engaging with sociocultural ways of being and acting. Sociodramatic play is a “play among plays,” that challenges children to exert the full force of their thoughts, emotions, and creativity in conducting such play, leading to their all-around development. Such an educational restructuring would nourish an active, agentic approach to learning, contributing to society, and changing the world for the better. Of course, such far-reaching transformation of the current U.S. educational system will require mass collective struggle and action on many fronts, from parents, educators, and children themselves. It is through this very collective process, however, that
individuals’ motivation for mastery of the world and ourselves will flourish, and human agency will be ultimately liberated.
Appendix

The New York City Department of Education Parent/Guardian

Home Language Identification Survey

Dear Parent or Guardian,

In order to provide your child with the best education possible, we need to determine how well he or she understands, speaks, reads, and writes English. In order to keep you informed, we would also like to know your language preference when receiving important information from

<table>
<thead>
<tr>
<th>TO BE COMPLETED BY ENROLLMENT OR SCHOOL PERSONNEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>District:</td>
</tr>
<tr>
<td>School:</td>
</tr>
<tr>
<td>Grade:</td>
</tr>
<tr>
<td>Relationship of person providing information for survey (check one):</td>
</tr>
<tr>
<td>Mother □</td>
</tr>
<tr>
<td>Father □</td>
</tr>
</tbody>
</table>

If an interview is conducted, list interviewer’s name and title or relationship.

In what language?

If an interpreter is provided, list name and position/relationship:
The school. Your assistance in answering the questions below is greatly appreciated.

Thank You

<table>
<thead>
<tr>
<th>Is the interpreter trained/qualified (e.g., bilingual teacher, Translation &amp; Interpretation Unit staff)?</th>
<th>Yes [ ] No [□]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligible for LAB-R testing?</td>
<td>Yes [□] No [□]</td>
</tr>
<tr>
<td>Person determining LAB eligibility and signature:</td>
<td></td>
</tr>
<tr>
<td>Lab Coordinator name and signature:</td>
<td></td>
</tr>
<tr>
<td>OTELE ALPHA CODE:</td>
<td></td>
</tr>
<tr>
<td>Program Placement: Transitional Bilingual Education [□]</td>
<td></td>
</tr>
<tr>
<td>(Is this a transfer? Yes [□] No [□])</td>
<td></td>
</tr>
<tr>
<td>Dual Language [□]</td>
<td></td>
</tr>
<tr>
<td>Freestanding ESL [□]</td>
<td></td>
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</tbody>
</table>

**PART 1. LAB-R ELIGIBILITY**: This information will establish eligibility for the English Language Assessment Battery-Revised (LAB-R). (✓) the box that applies. If another language is used, please specify.

| 1. What language does the child understand? |
|---|---|
| English [□] Other [□]: |
2. What language does the child **speak**?

| English □ | Other □: |

3. What language does the child **read**?

| English □ | Other □: | Does not read □ |

4. What language does the child **write**?

| English □ | Other □: | Does not write □ |

5. What language is spoken in the child’s home or residence most of the time?

| English □ | Other □: |

6. What language does the child speak with parents/guardians most of the time?

| English □ | Other □: |

7. What language does the child speak with brothers, sisters, or friends most of the time?

| English □ | Other □: |

8. What language does the child speak with other relatives or caregivers (e.g., babysitters) most of the time?

| English □ | Other □: |

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**PART 2. INSTRUCTIONAL PLANNING:** Responses to these supplementary questions will be used for instructional planning. Enter the correct response for each of the following questions concerning your child.

1. Is this the first time the child has attended a school in the United States?  □ Yes  □ No

   **IF NO:**

   Where did he/she go to school?
<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>How long did he/she attend school?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Which language was used for instruction?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Has the child attended school in another country? □ Yes □ No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF YES:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where did he/she go to school?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How long did he/she attend school?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Which language was used for instruction?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Did the child participate in any group experience prior to entering school (e.g., daycare, pre-school)? □ Yes □ No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF YES: What language was used?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Does the child use any other form(s) of communication, such as American Sign Language or Augmentative Communication Device (e.g., Communication Board-manual/electronic)? □ Yes □ No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF YES: Which ones?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PART 3. PARENT INFORMATION:** Responses to these supplementary questions will be used so that the NYC Department of Education can communicate with you in the language of your choice.

1. In what language would you like to receive written information from the school?

2. In what language would you prefer to communicate orally with school staff?

| Parent Signature | Date |
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