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Academic Help-Seeking Behaviors in Young Children

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An Honors Thesis on Academic Help-Seeking Behaviors in Young Children

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Abstract

Private speech and help-seeking behaviors have found new traction through Zimmerman's conceptualization of self-regulated learners as "metacognitively, motivationally, and behaviorally active participants in their learning….and are aware when they know a fact or possess a skill and when they do not and, unlike passive classmates. . .proactively seek out information when needed and take necessary steps to master it" (1990, p. 4). The current study is a follow-up of *Metacognitive processes in Development* [MinD], through which researchers Lindsey Nelson and Professor Loren Marulis analyzed metacognitive skills (i.e., knowledge and behavior) using a puzzle task at the Connecticut College Children's Program Lab School (2-5 year olds), by examining associations to executive functioning and motivation. Many of the children used expressive language (help seeking and private speech) during the puzzle task, particularly when it became challenging to self seemingly soothe, problem-solve, and speak about prior experiences/ knowledge. To explore this further, this study investigated the potential relations and mediating effects of academic help-seeking and private speech behaviors on metacognitive, executive functioning, and motivation processes in 2-to-5-year-olds. Results indicated that private speech, but not help seeking, was significantly correlated to metacognitive and executive functioning processes. Lack of significance for help seeking was likely due to a measurement issue that I intend to remedy in future studies. For now, I propose that expressive language (to self or others) is a useful strategy in problem-solving situations, and is a critical mechanism for enhancing self-regulated learning.

Keywords: help seeking, private speech, self-regulation, metacognition, executive functioning, motivation.

Humans are active, vigorous participants in their own existence.
(Vygotsky, 1978, p. 123)

Part I: Theoretical Background

Section i: Introduction to Self-Regulated Learning

Help-seeking expert Richard Newman (2000) theorizes there are two types of learners: active and passive. Active learners are self-regulated learners, who have strong cognitive, social, and affective-motivational skills (Newman, 2000), which leads to higher academic achievement (Zimmerman, 2008). Passive learners on the other hand, have limited initiative to set goals, plan ahead, employ effective learning strategies, and therefore suffer from lower academic achievement. Though generally, we know that while *some* children use passive strategies and fall into habits that are unproductive for thinking and learning, *all* children have the ability to actively monitor and regulate their own learning.

Broad Context: Early Learning Theories

Before diving into the specifics of self-regulated learning—the broad construct from which this report is driven—it is first important to briefly review the major early learning theories that have inspired my passion to better understand child development. Generally, these theories have been conceptualized and categorized into two broad domains: social and cognitive. Erik Erikson (1963), with his psychosocial theory of development, and Urie Bronfenbrenner (1979), with his ecological systems theory of development were some of the first to pioneer theories of *social* development, essentially suggesting that people grow and learn primarily as a result of environmental influences. Alternatively, Jean Piaget (1954), with his theory of cognitive

development, and Lev Vygotsky (1978), with his sociocultural theory of development, were some of the first to pioneer theories of *cognitive* development, essentially suggesting that people are primarily the driving force behind their own—and to varying degrees depending on the theorists— and others' development (Snowman & McCown, 2015).

Yet here, it is important to note that while these theories are somewhat contradictory in nature (e.g., they embody the nature versus nurture debate), they are not, in reality, so black and white. Erikson and Bronfenbrenner's theories on social development also encompass cognitive constructs, and Piaget and Vygotsky's theories on cognitive development also rely on social influences. In other words, social and cognitive factors are bidirectional in nature, and in the twenty-first century, it is generally agreed that development is really housed within this grey area between social and cognitive models of development.

More recently, psychologists have proposed an additional handful of theories that better account for this grey area: information-processing theory posits, "learning results from an interaction between an environmental stimulus (the *information* that is to be learned) and a learner (the one who *processes*, or transforms, the information)" (Snowman & McCown, 2015, p. 264). Social cognitive theory posits, "people, and not environmental forces, are the predominant cause of their own behavior," and that "behavior is the result of interactions among personal characteristics, behavior, and environmental factors" (Snowman & McCown, 2015, pp. 297-298). Finally, constructivist theory posits, "meaningful learning occurs when people actively try to make sense of the world [e.g., the environment]. . .by filtering new ideas and experiences through existing knowledge structures" (Snowman & McCown, 2015, p. 346).

Overall, the field has come a long way from its original conceptualization of a child as a *tabula rosa* (i.e., "a blank slate") that requires careful molding by others; and from the black and

white conceptualizations of social versus cognitive theories of development. Today, psychologists generally agree that learning and development occur as a result of complex and multifaceted interactions between people and the environment. Though, it is important to note that there are differences between social and cognitive influences on development, perhaps most important of which involves the aspect of control. Children are not often able to control environmental factors (e.g., teachers' expectations); yet, children who have developed strong metacognitive monitoring and control behaviors (see Part II, Section ii segment on metacognition and Part III for further explanation of this concept) often *do* have a sense of agency over *cognitive* factors (e.g., employing skills and strategies to solve a problem); these cognitive control (and monitoring) mechanisms serve as the foundation for this report.

Specific Context: Self-Regulated Learning

This concept of control is best understood within the realm of self-regulation theories, which posit that children are active learners who exhibit high-level thinking skills (e.g., metacognition, executive functioning, theory of mind, and motivation) in order to learn about and engage with the world around them. While self-regulation has existed as a leading psychological framework since the earlier days of Piaget, Vygotsky, Erikson, and Bronfenbrenner, it has recently gained new traction with the work of Barry J. Zimmerman. He conceptualizes self-regulated learning generally as the process of "students becoming masters of their own learning" (1990, p. 4). More specifically, he remarks that "self-regulated learners are aware when they know a fact or possess a skill and when they do not. . .they proactively seek out information when needed and take the necessary steps to master it. . .they accept greater responsibility for their academic outcomes. . .[and] they are metacognitively, motivationally, and behaviorally active participants in their own learning" (1990, p. 4).

More specifically, Zimmerman envisions self-regulated learning as a cyclical process consisting of 1) forethought (i.e., task analysis and self-motivational beliefs), 2) performance (i.e., self-control and self-observation), and 3) self-reflection (i.e., self-judgment and self-reaction) (Zimmerman, 2000; Zimmerman & Campillo, 2003). Additionally, each phase is made up of varying amounts of: 1) metacognitive processes, characterized by "planning, setting goals, organizing, self-monitoring, and self-evaluation at various points during the process of acquisition" (p. 4), 2) motivational processes, characterized by "high self-efficacy, self-attributions, intrinsic task interest. . . .[and] extraordinary effort and persistence during learning," (p. 5), and 3) behavioral processes, characterized by "selecting, structuring, and creating environments that optimize learning. . . . [self-regulated learners] seek out advice, information, and places where they are most likely to learn" (p. 5) (see Figure 1).

Figure 1. Model of Self-Regulated Learning. From Zimmerman & Campillo, 2003, p. 239.

For example, think of a young child working on completing a puzzle; in this example, the child is looking to reconstruct the image of a dog sitting next to a fire hydrant that is on the front

of the box that contains the puzzle. In order to be successful in completing this task, the child must remain metacognitively (e.g., actively monitoring and controlling learning strategies), motivationally (e.g., continuously reinforcing a sense of self-efficacy), and behaviorally (e.g., staying on task) engaged in the task while going about the cycle of self-regulated learning. To do so, he must: 1) examine the image and make a plan (e.g., group edge pieces together) (i.e., forethought phase), 2) place the pieces together to recreate the picture (e.g., check the puzzle against the image on the front of the box) (i.e., performance phase), and 3) assess the final product (e.g., making sure all the pieces were used) (i.e., self-reflection phase). This is truly an effective method to tackle any problem-solving situation in the classroom.

The MinD Project

Why is this important? Broadly, self-regulated learning is the umbrella construct that encompasses effective learning strategies and behaviors. In this report, it is not my intention to dissect each and every subcomponent of self-regulated learning. Rather, I intend to extend *Metacognitive processes in Development* [MinD], on which I am collaborating with Connecticut College Professor Loren Marulis. Professor Marulis began this project in 2010 with her three-study dissertation at the University of Michigan (Marulis, 2014) to better understand the construct of metacognition in early childhood. Results revealed that:

> Preschoolers were able to articulate their metacognition related to a meaningful task and, as predicted, showed significant growth over a school year. . . .[Additionally], children who received [a] metacognitive intervention obtained significant gains on metacognitive strategies and knowledge as well as cognition skills (memory) whereas the children in the comparison group did not. Some individual differences were found related to executive functioning and expressive vocabulary as well as SES. Importantly,

> children with higher metacognitive skills had higher pre-academic achievement regardless of SES status. (Marulis, personal communication, April 2, 2017)

During the spring of 2015, Professor Marulis invited me to collaborate on the MinD project (which I will discuss in more detail in Part III of this report). We collected video-recorded data and analyzed 2-to-5-year olds' metacognitive skills (i.e., knowledge and behavior) on a puzzle task at the Connecticut College Children's Program Lab School. We also examined associations between early metacognition, executive functioning, and motivation. As a result of video analysis of this data, we noticed that many of the children employed private speech and help-seeking behaviors during the puzzle task. As learning strategies, this piqued our interest and serves as the basis for this report. Specifically, my focus in this broader project—which was originally designed to study the development, predictability, and predictions of preschool-aged children's metacognitive processes—is to propose that expressive language (i.e., private speech and help-seeking) that is on task, directed to self or others, is a critical mechanism in enhancing self-regulated learning in early childhood (see Newman, 2006).

Section ii: Introduction to Private Speech

While not the focal point of this report, it would be remiss to describe help-seeking behaviors—the central focus of my research interests and pursuits—without incorporating its frequent companion (particularly in early childhood), private speech. Winsler, Fernyhough, McClaren, & Way (2005) write:

> Child and adult speech utterances are typically classified as either social speech or private speech. Social speech is addressed to another person as indicated by either a pronoun reference, a gaze to another person, or other signals of social intent, such as physical

> contact, argumentation, or conversational turn-taking. Private, or self-directed, speech refers to the audible or visible talk children use to communicate with themselves as they go about their daily activities. (p. 2)

Or, in the words of Piaget, it is "the phenomenon of speech that apparently is not directed at any listener" (Vygotsky 2012, p. xv). Interestingly, Piaget originally categorized private speech as "egocentric" and unimportant (Vygotsky, 2012, p. xv) because the child does not actually address anyone (Vygotsky 2012). And it was not until the 1930s (though his work was not translated from Russian into other languages and so was not widely read until the 1980s) when Vygotsky suggested that children's language abilities might actually be "an important developmental tool leading a child toward self-regulation," that early expressions of language were taken seriously (Vygotsky, 2012).

As a result of experiments designed to further dissect "egocentric" speech, Vygotsky discovered that the progression of thought and speech are only parallel until the age of two, when the development of these constructs becomes interwoven, leading to something entirely new altogether (Vygotsky 2012); he coined this new way of integrating thought and language as "verbal thought, or meaningful speech - a union of word and thought" (Vygotsky 2012, p. 225). Psychologist William Stern remarked that this "union" is "the greatest discovery of [a child's] life" (Vygotsky 2012, p. 87).

Further, Vygotsky's (1978) research revealed that although private speech/ egocentric speech/ verbal thought initially consists of only description and analysis, it gradually takes on a "'planful' character, reflecting possible paths to solution of the problem" (p. 25), and ultimately becomes part of a solution itself. In other words, private speech occurs in early childhood when a child (in Vygotsky's experiments, around age 4 or 5) is in the midst of problem solving: from

understanding and describing, to planning, organizing, and actually "solving" the problem. Older children, on the other hand, "behave differently: they scrutinize the problem, think (which is indicated by long pauses), and then find a solution" (Vygotsky 2012, p. 32), thus displaying developmentally appropriate internalized private speech behavior, or "inner thought," which incidentally, is much more complex because it is, by definition, "the act of thinking" (p. 262). It is so complex that psychologist John Watson said that it "would be incomprehensible even if fully recorded" (Vygotsky, 2012).

In conclusion, Vygotsky (1978) claims that young children are not able to act towards a goal without some sort of self-directed problem-solving monologue. He suggests that their use of private speech actually enables them to consider and include additional methods, or "tools" (p. 26), of problem solving that are not physically readily available to them. Vygotsky was the first to suggest that private speech supports children's self-regulatory and problem solving skills, and now in the twenty-first century, this has been confirmed time and time again (e.g., Aro, Poikkeus, Laakso, Tolvanen, & Ahonen, 2015; Bono & Bizri, 2014; Montero & De Dios, 2006; Winsler, Manfra, & Diaz, 2007). In fact, thanks to Vygotsky and other more recent research, we have a solid and informed understanding of the various nuances of private speech: we know that private speech is minimal when tasks are too easy and too hard, but "when the task is within the child's zone of proximal development the amount of private speech is high. Moreover, the presence of task-relevant private speech is indicative of the child's performance not only with the present but also with future tasks" (Vygotsky 2012, p. xvii). We also know that private speech eventually becomes internalized (i.e., "inner speech"), typically sometime between ages 3 and 7 (Vygotsky, 2012, p. 244), and that this "loss" of vocal self-talk is replaced by a much more highly dynamic and complex form of processing (Vygotsky 2012, p. 244).

With this great shift from "using language merely for communicative purposes to using it also as a tool to regulate behavior" (Aro et al., 2015, p. 509), young children make many other great developmental strides in self-regulation, as they take more and more responsibility for their own behavior. Not solely in communication with themselves, young children also learn how to communicate effectively with others. They are then able to use this newfound understanding of self and others to more actively and effectively include others in problem solving scenarios. As a result, young children begin to learn that they have the power to use their newfound discovery of expressive language to ask for help when they are not able to accomplish something on their own.

Section iii: Introduction to Help-Seeking Behaviors

Vygotsky (1978) himself made the link between private speech and help-seeking behaviors in his landmark piece, *Mind in Society*. As a result of his extensive work on the development of expressive language in young children, he proposed that when a task is too challenging for a young child, he "may attempt to solve the task through verbal formations *and* by appeals to the experimenter for help. . . .[and] by asking a question, the child indicates that he has, in fact, formulated a plan to solve the task before him, but is unable to perform all the necessary operations" (p. 29). This bid for help is actually beneficial to a child's problem-solving process.

Expedient/ Executive Help Seeking

However, help-seeking behaviors were traditionally perceived as indications of "incompetence, dependence on others, and immaturity" (Newman, 2000, p. 351), in other words,

as a deficiency in development (Butler, 2006; Karabenick & Gonida, in press; Karabenick & Berger, 2013; Karabenick, 2006; Nelson-Le Gall, 1985; Newman, 2006). Think of, for example, a young child who refuses to even try to complete a puzzle: *"I can't do it,"* he says to his teacher, *"Can you do it for me?"* Here, this young child is asking for help without any proof or indication that he actually needs assistance. His asking for help is not advantageous to his cognitive development, as he is not actively seeking to fill a gap in his knowledge. His motivation in asking for help is to simply opt out of completing the task altogether. This is *expedient/ executive* (Karabenick & Berger, 2013; Karabenick, 2006; Nelson-Le Gall, 1985; Nelson-Le Gall, Gumerman, & Scott-Jones, 1983) help seeking, "which is effort-avoidant, unnecessary, perpetuates dependency" (Karabenick, 2006, p. 2), and "is expressed in bids for direct help in the form of solutions or clear directions that facilitate task completion by mobilizing someone else to solve the problem" (Butler, 2006, p. 18).

Adaptive/ Instrumental Help Seeking

More recently, however, researchers have begun to understand help-seeking behaviors in a drastically different light. We now know that an *adaptive/ instrumental,* meaning necessary and well-planned (Newman, 2000, 2006), form of help seeking is an increasingly important and strategic learning skill (Butler, 2006; Coughlin, Hembacher, Lyons, & Ghetti, 2015; Karabenick & Berger, 2013; Karabenick, 2006; Nelson-Le Gall et al., 1983). This form of help seeking "refers to those instances in which the help requested is limited to the amount and type needed to allow children to solve problems or attain goals for themselves" (Nelson-Le Gall et al., 1983, p. 266); it "is expressed in requests for indirect help, in the form of hints or explanations that advance understanding and support future independent mastery by clarifying methods and strategies or identifying difficulties" (Butler, 2006, p. 18).

In this sense, "seeking help can be classified as an act of effort in that the help-seeker is actively using available resources to increase the likelihood of future success" (Nelson-Le Gall, 1985, p. 65). Newman further specifies this construct explaining that adaptive help seeking is contingent on the following: "(a) *necessity* of the request (i.e., is it necessary that I ask another person for help?); (b) *content* of the request (i.e., what should I ask?); and (c) *target* of the request (i.e., whom should I ask?)" (Newman, 2006, p. 227). It is also reliant on an individual's "cognitive competencies" (e.g., monitoring task performance), "social competencies" (e.g., knowing how to ask for help), and "affective-motivational resources" (e.g., self-efficacy) (Newman, 2006, p. 228).

This skill, adaptive help seeking, is an integral part of early development because, just as with the development of private speech, early childhood is the time when children learn to take responsibility for their own regulation and take action for themselves; it is also the time when they learn to take advantage of the various resources in their environments to help them accomplish goals. Richard Newman, a leading expert in this field, conceptualizes this kind of help seeking generally as a student who actively "monitors his or her academic performance, shows awareness of difficulty he or she cannot overcome independently, and [seeks to remedy] that difficulty" by asking for help (Newman, 2000, pp. 350-351). In this sense, help seeking, like private speech, is undoubtedly an adaptive self-regulatory learning strategy (Karabenick & Gonida, in press).

Developing a Help-Seeking Model

In this sense, help seeking is also undoubtedly an adaptive *metacognitive* learning strategy. First introduced by Flavell in 1971, metacognition is "thinking about thinking." Over the years, research has mostly examined metacognition in older children and adults, indicating

that there are robust associations between metacognition, learning, academic achievement, and other positive life outcomes (e.g., August, Flavell & Clift, 1984; Borkowski, Carr, & Pressley, 1987; Bransford, Brown, Cocking, 2000; Carr, Kurtz, Schneider, Turner & Borkowski, 1989; Garner, 1990 as cited in Marulis, 2014, p. 9). Research examining metacognitive processes and their associations to other processes at a young age, when it is most likely to affect subsequent developmental and academic trajectories, has rarely been undertaken (for exceptions, see Marulis, Palincsar, Berhenke, & Whitebread, 2016; Shamir, Mevarech, & Gida, 2009; Whitebread, Coltman, Pino-Pasternak, Sangster, Grau, Bingham, Almeqdad, & Demetriou, 2009; Whitebread, Bingham, Grau, Pasternak, & Sangster, 2007).

As previously mentioned, through our current research, broadly titled *Metacognitive processes in Development* [MinD], Connecticut College Professor Loren Marulis and I have been investigating metacognitive processes as unique predictors for learning-related skills such as executive functioning and motivation in young children (Marulis & Nelson, 2016). Interestingly, our most recent work has revealed that metacognitive knowledge—a child's ability to vocalize his knowledge of "people, tasks, and strategies" (Flavell 1979, as cited in Marulis, 2014, p. 75) in an interview directly following a developmentally appropriate puzzle task falling within his zone of proximal development—uniquely predicted metacognitive behavior, motivation, and executive functioning in young children *above and beyond age*. This points to the importance of higher-level thinking processes in child development and is very much related to the metacognitive monitoring, control, and awareness of environment and resources that are required in help-seeking behaviors. Nelson-Le Gall (1985) writes:

> Children's ability to engage in [help-seeking behaviors] depends in part on their metacognitive knowledge (cf. Flavell, 1977) concerning (a) the characteristics of the

> help-seeker (person variables), (b) the characteristics of the target helper and nature of the problem (task variables), and (c) the suitability of the means employed to gain assistance (strategy variables). . .If individuals have some awareness of the complexity of the task and can monitor their progress on the task well enough to detect a problem, they are in a relatively good position to utilize help-seeking as a strategy to enable them to cope with the problem. (p. 71)

With this conceptualization in mind, psychologists have been working to make sense of what the process of help-seeking looks like. At this point, it is best understood in conjunction with Zimmerman & Campillo's (2003) model of self-regulated learning mentioned previously. Naturally, help seeking is an important "strategy of self-regulated learning" (Newman, 2000, p. 351), and is a critical skill for healthy development in multiple arenas (Karabenick & Gonida, in press); it is one of many critical learning mechanisms that efficient self-regulated learners have in their toolkits (Newman, 2000, 2006). Barry Zimmerman, the leading expert on self-regulated learning himself, claims that "students who [are] high in their overall use of self-regulation strategies [seek] help more frequently from peers, teachers, and parents and learn more than students who [do] not seek help" (Zimmerman, 2008, p. 169).

In fact, help seeking aligns with the framework of self-regulated learning so well that researchers Karabenick and Berger (2013) created a parallel model of help seeking to match that of Zimmerman (2000). Zimmerman's forethought, performance and self-regulation parallel Karabenick and Berger's stages 1-5 (preparing to act), stages 6-7 (obtaining help), and 8a-8b (reflection and response) (see Figure 2).

	Stages of the Help-Seeking Process	Processes of Self-Regulation	SRL Phase in the Zimmerman Model
1	Determine whether there is a problem	Task analysis	Forethought
2	Determine whether help is needed/wanted		
3	Decide whether to seek help	Strategic planning	
4	Decide on the type of help (goal)		
5	Decide whom to ask		
6	Solicit help	Self-control	Performance
7	Obtain help		
8a	Process the help received—judge or evaluate it	Self-judgment: self-evaluation	Self-Reflection
8b	Process the help received—react to it	Self-reaction: self-satisfaction and adaptive inference	

Figure 2. Stages of the Help-Seeking Process and Three-Phase Model of SRL. From Karabenick & Berger, 2013, p. 240.

Karabenick and Berger (2013) propose that the forethought phase is influenced by self-motivation, specifically self-efficacy, outcome expectations, task value (i.e., the cost and benefits of seeking help), and goal orientation; in this phase, "help seeking may occur as a result of task analysis" (Karabenick & Gonida, in press, p. 2). Further, the performance phase is characterized by considering what, when, and who to ask for help; in this phase, help seeking may occur "as a result of self-observation and error identification" (Karabenick & Gonida, in press, p. 2). Lastly, the self-reflection phase includes self-judgment (e.g., Did I do a good job?), self-satisfaction (e.g., Did I get my question answered?), and self-evaluation (e.g., Do I need to do anything differently next time?); in this phase, help seeking may occur "as a consequence of self-evaluation that suggests the need for further assistance" (Karabenick & Gonida, in press, p. 2).

Additionally, Karabenick and Berger (2013) stress that just as Zimemrman's model of self-regulated learning is cyclical in nature, so too is their model of help seeking. Though, it is by no means "fixed;" often, the steps happen out of order and without people consciously being aware that they are doing it. They say, "in most instances, the process probably involves a

combination of automatic and controlled cognitive and motivational processing that may begin at various points" (p. 239). Finally, it is important to note here that Karabenick and Berger (2013) did not specify a specific age range that their model targets or represents. As most of Karabenick's work has largely explored help-seeking behaviors in older children, adolescents, college students, and adults, it is likely that this model (Figure 2) is also reflective of development well beyond the preschool years. Nevertheless, as a result of our findings from part one of the MinD project (Marulis & Nelson, 2016), which reveal that even young children are able to exhibit metacognitive skills during a problem solving task, I hypothesize that much of Karabenick and Berger's (2013) model holds true for young children. Going forward, this is worthy of further study.

Essentially, conceptualizations of self-regulated learning, metacognition, and help seeking are interrelated. Broadly, self-regulated learning consists of 1) forethought, 2) performance, and 3) self-reflection (Zimmerman, 1990); Metacognition consists of 1) monitoring, and 2) control (Nelson & Narens, 1994); and adaptive help seeking consists of "a series of steps or stages, where learners" (Karabenick & Gonida, in press, p. 3) (see Figure 3):

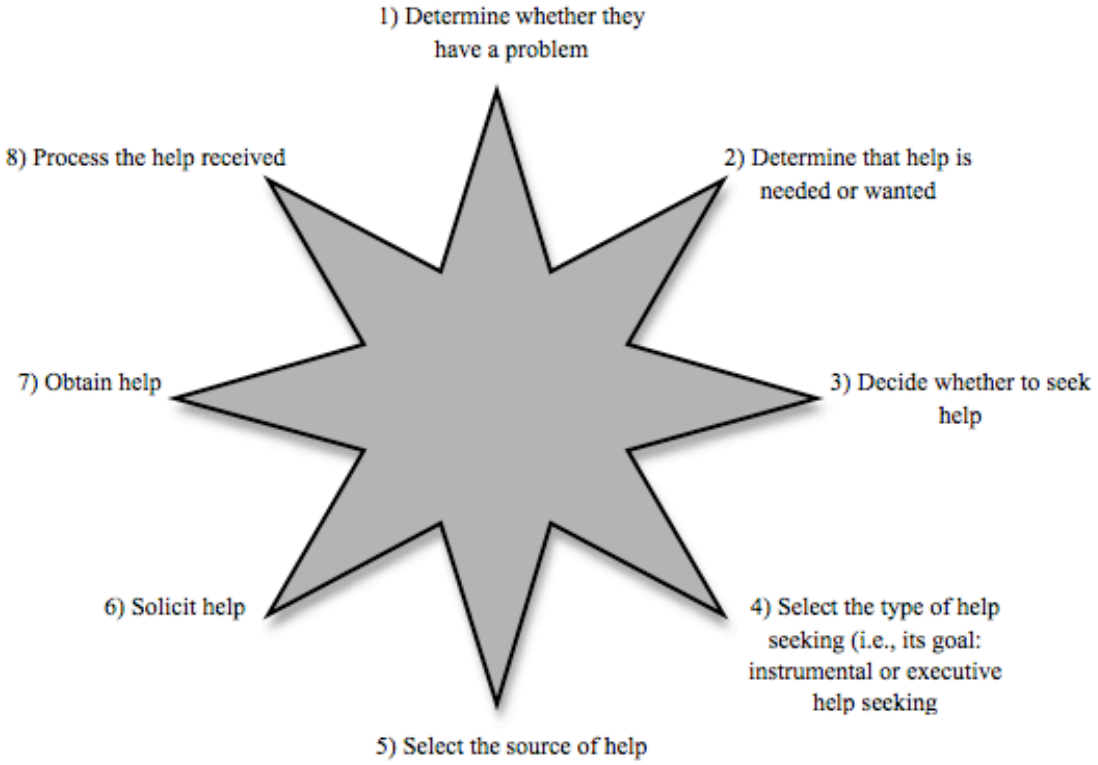


Figure 3. Amalgamation of help-seeking models. Adapted from Karabenick & Gonida, in press, p. 3.

In a nutshell, adaptive help seeking is cognitive, social, and metacognitive all at the same time and is ultimately mediated by individual differences in all these areas (Newman, 2000).

Part II: Important Mediating Factors in Help-Seeking Behaviors That Stand Out in the Literature

Adaptive help seeking is unique in that it, 1) unlike many other components of self-regulated learning, involves other people and is therefore more susceptible to a great variety of mediating factors (Karabenick & Gonida, in press; Karabenick & Berger, 2013), and 2) "it is the only strategy that is potentially stigmatizing due to its implications of inadequacy" (Karabenick & Gonida, in press, p. 2).

Section i: Environmental Effects

It is important to discuss what factors, contexts, and situations are optimal for facilitating help-seeking behaviors in young children. Most influential is the home environment, the school environment, peer relationships (Newman, 2000), and cultural norms (Nelson-Le Gall, 1985).

Cultural and Social-Normative Variables

In the broadest sense, the location that every child inhabits is influenced by cultural norms and expectations, varying significantly from country to country, family to family, and person to person. Generally, cultures tend to be collectivistic, emphasizing dependency and interconnectedness, or individualistic, emphasizing independence and self-reliance (Nadler, 1983; Volet & Karabenick, 2006; Sandoval & Lee, 2006). Think of Urie Bronfenbrenner's ecological systems theory (1979), in which every child is influenced by multiple spheres of influence, from the microsystem of family, friends, and teachers, to larger macrosystems defined by culture (see Figure 4).

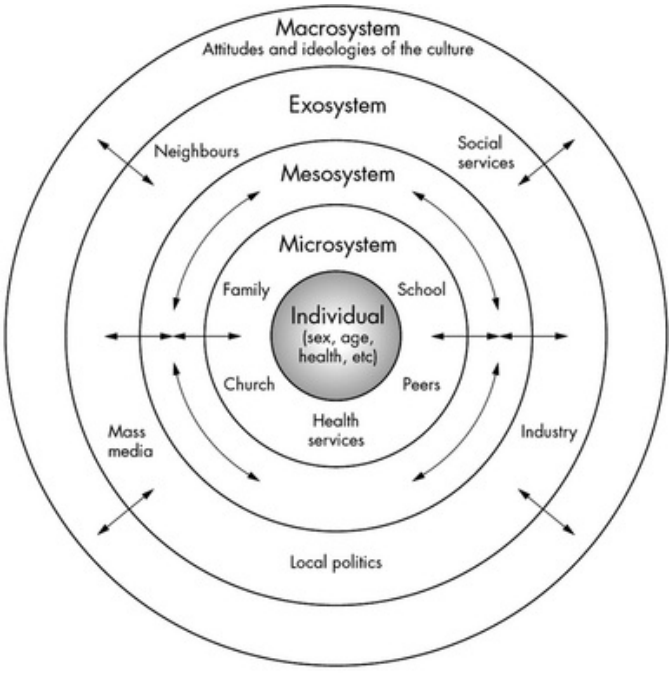


Figure 4. Urie Bronfenbrenner's Ecological Systems Model. From "Bronfenbrenner's Ecological Systems Model," n.d.

Through the lens of a social-normative perspective, it is clear that "cultural norms emphasizing self-reliance and individual achievement may influence attitudes toward help-seeking. Accordingly, individuals could be expected to differ in the tendency to seek help as a function of the degree to which they have internalized these societal norms and values" (Nelson-Le Gall, 1985, p. 57). Consider gender roles in Western culture, for example, in which males have traditionally been perceived as the stronger, more dominant sex, and females as the weaker, more submissive sex. When a social norm such as this is internalized, individuals will act accordingly so as to avoid social "costs" such as defiance or embarrassment (Nelson Le-Gall, 1985). In this example, this materializes itself in women feeling more comfortable asking for help than men because it is a "sex-role-consistent behavior" (Nelson-Le Gall, 1985, p. 57). In general, "based on differences in conceptually relevant cultural values, individuals in different cultures may display differential degrees of help-seeking behavior" (Nadler, 1983, p. 326).

More specifically, "norms of individualism and collectivism affect the acceptability of help seeking, which in turn affect *whether* individuals engage in help-seeing behaviors" (Sandoval & Lee, 2006, p. 157). In Western cultures (e.g., the United States of America), help seeking is inconsistent "with the values of competitiveness, self-reliance, and independence that are characteristically emphasized" (Nelson-Le Gall, 1985, p. 56) in media, schools, communities, and families (Newman, 2006; Volet & Karabenick, 2006). However, in non-Western cultures (e.g., Asia, Latin America, and Africa), help seeking is much more consistent with societal values of "harmonious interdependence" (Sandoval & Lee, 2006, p. 162) (see Figure 5).

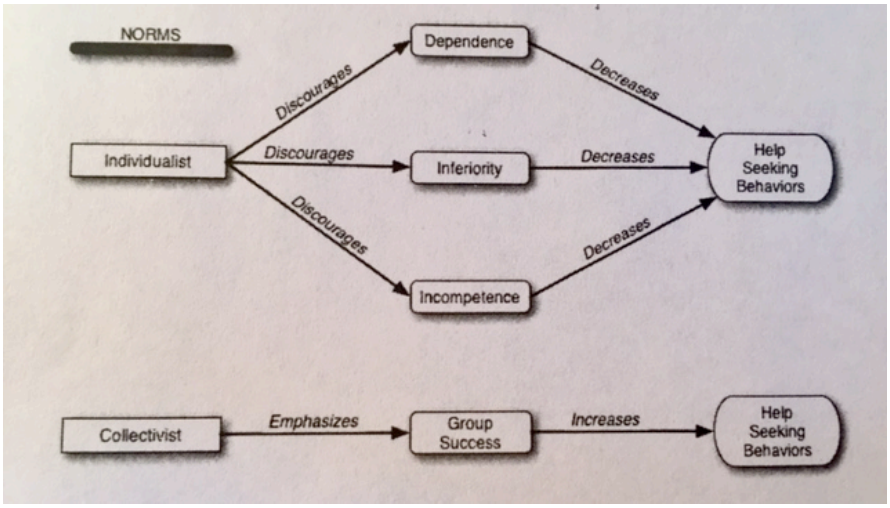


Figure 5. Help seeking in individualist and collectivist norms. From Sandoval & Lee, 2006, p. 161.

However, the relation between help seeking and culture is not always so black and white. For example, Japanese students, who are socialized in a collectivistic culture of inter-group reliance and cooperation, often shy away from asking for help in academic settings. Why? Because Japanese education does not highlight a constructivist or self-regulated (i.e., thinking characterized by forethought, performance, and self-reflection (Zimmerman & Campillo, 2003) model of thinking in which students take ownership of their own learning; rather, they are socialized to be passive recipients of their elders' knowledge and wisdom (Butler, 2006; Shwalb

& Sukemune, 1998). Both collectivistic and paradoxically *less* inclined to employ help seeking as an effective learning strategy, this example highlights how truly individualized help-seeking behaviors are across cultures, classrooms, and individuals.

While there is ample evidence of multicultural help seeking tendencies in domains such as in health and mental health industries, research on the differences in help-seeking behaviors in various cultural *academic* settings is limited at this time. Yet, it is plausible to infer that variables such as ethnicity, language, and cultural socialization, which are related to individuals' willingness to seek help in various health settings, are also relevant and related to academic settings as these factors often act as barriers across domains that threaten individuals from minority cultures from seeking help in a White, Eurocentric society (Volet & Karabenick, 2006).

Essentially, more research on this is critical if we are to understand how cultural variations in motivation, achievement-orientation, attitudes towards learning, and belief systems are related to and predictive of help-seeking behaviors in different cultural groups. This is challenging simply due to the complex nature of "culture," which is dynamic and ever changing. Additionally, "culture" is always connected and incorporated with other mediating factors such as age, gender, and an individual's self-concept. At this time, while there is simply not enough empirical evidence to explicitly claim that culture, as a single variable, is *predictive* of academic help-seeking behaviors, it is undoubtedly *related* and simultaneously intertwined with other more predictive factors (Volet & Karabenick, 2006).

Parents

Parents, for example, are highly interwoven within broader cultural influences. Again, thinking of Urie Bronfenbrenner's (1979) ecological systems model (Figure 4), parents are situated within the broader sphere of cultural influence. More closely connected to the child than

broader spheres of culture and community, parents play an important role in creating a nuclear home environment that acts as a foundation for their child's development. On the topic of help seeking, parents influence their children's help seeking behaviors in the ways they model and respond to it; this starts at birth.

Though we might not think of it as such, babies do indeed exhibit help-seeking behaviors. They babble, cry, reach with their hands, and point to things that they want – these are all examples of early help-seeking behaviors. Importantly, this "intentional communication," first exhibited by gestures, is greatly influenced by attachment style and parental responsiveness. Parents who have established close bonds of trust, are quick to respond, and who respond with care, are more likely to scaffold positive conceptions about help seeking as a self-regulated learning strategy in their children than are parents who have not established bonds of trust, who are slower to respond, and are less thoughtful in their responses. Children's perceptions of parental responsiveness to early bids for help dramatically impact their trustworthiness of the resources around them (Newman, 2000).

Logically, infants with secure attachments do better on problem-solving tasks than infants with insecure-attachment relationships and avoidant-attachment relationships. Newman (2000) says that, "maternal involvement and responsiveness to the child's needs are instrumental in the development of a sense of efficacy and confidence to step away from the secure base and explore novel and challenging situations" (p. 357). Children have the potential to develop a sense of agency over their learning and acquire the knowledge that help seeking can be an effective strategy for learning quickly and early on in their development, around age 2 or 3 (Newman, 2000). Naturally, parents' personal involvement with their young children explains the

development of affective-motivational resources that are necessary for young children to persist in challenging situations and feel comfortable asking for help (Newman, 2000).

Importantly, interactions with siblings and with parents in the home is good practice for learning effective ways of communicating, which are ultimately transferrable to classroom settings (Newman, 2000). In accordance with Vygotsky's theory of socialization, children internalize what their parents do as a model. Studies show that *how* adults view their children, the means in which they engage in conversation with them, and *how* they help them, actually affects children's levels of self-efficacy and success (Newman, 2000). Parental responses that directly answer a question or solve the problem for their child are less effective than responses that involve prompts, explanations, and questions. In the latter case, children have higher engagement and higher perceived control over their own learning (Newman, 2000).

Teachers

Like parents, teachers are also more centrally located within a child's direct sphere of influence (again, reference Urie Bronfenbrenner's ecological systems model (1979); see Figure 4). Like parents are critically important in the home, teachers are critically important in school settings as they are in control of the dynamic of their classrooms. Developmentally, it is appropriate for children to enter preschool around age 3 or 4, just as they are beginning to learn how to regulate their social, cognitive, and emotional functioning. The school environment offers an array of scaffolding activities and situations that continue to enhance early childhood development, compelling better regulation, metacognitive awareness, inquisitiveness, and social skills as children experience an increased need to become "agents of their own learning" (Newman, 2000, p. 361).

With the transition to school, children gain more role models from which to internalize socially "correct" behavior. And as a result of the social dynamic of early childhood education classrooms, preschool and kindergarten pushes children to develop better regulation, metacognitive awareness, inquisitiveness, and social skills (Newman, 2000). Important to consider here, however, is the inherent social hierarchy that exists within classrooms wherein students are subordinate to their teachers. With this structure in place, it makes sense for students to be dependent on their teachers. Nelson-Le Gall (1985) says "giving help is a behavior consistent with the teacher role, whereas receiving and seeking help are behaviors consistent with the reciprocal role of student" (p. 58). However, asking a teacher for help is perhaps more complicated than one might believe, because of this power dynamic, this asymmetrical relationship of respect, affection, dedication, dependability, and attunement that exists between a teacher and his or her students. Naturally, some teachers are more well-liked than others, and some teachers manage their classrooms more effectively than others; in fact, "perceived risks [regarding help-seeking behaviors] may be mediated by the classroom norms. . .that the teacher establishes and enforces" (Nelson-Le Gall, 1985, p. 59).

Karabenick and Gonida (in press) suggest that teachers who provide both (a) "instructional"/ "instrumental" support, which facilitates "students' cognitive and metacognitive competencies" (p. 17) *and* (b) "emotional" support, which facilitates students' "motivational and social competencies [that are] required for adaptive help seeking" (p. 17), are the most successful in helping their students become high-functioning self-regulated learners and adaptive help seekers. The sweet spot lies in teachers' ability to be sensitive both to their students' development of knowledge, skills, and strategies as well as their blossoming self-concepts and competencies.

Further, if teachers make themselves accessible and helpful to their students, and if they establish learning environments and classroom norms that are facilitative of help-seeking and other self-regulatory skills, strategies, and behaviors, young children are more likely to view their teachers as a positive resource to approach when seeking help or other kinds of support (Karabenick & Gonida, in press; Newman 2000; Sandoval & Lee, 2006). Research does indeed suggest that children as young as 2 years old are able to distinguish between "good helpers" and "bad helpers" (Cluver, Heyman, & Carver, 2013). And Newman (2000) says "children as young as preschoolers and 1st-graders say they go to the teacher for academic help because of specific needs. . .and because of the teacher's global, affective traits. . .and competence" (p. 367). When teachers place emphasis on effort and mastery rather than on ability and performance, children will not only be more likely to feel comfortable asking for help, but will also develop a more effective toolkit of self-regulatory learning strategies that will serve them throughout their lifetime of learning (Butler, 2006; Karabenick & Gonida, in press; Snowman & McCown, 2015).

Development of Psychological Cost and Teacher Expectations

However, regardless of teacher approachability and resourcefulness, students begin to feel a strong perceived "cost" of asking for help as early as second grade. In other words, a shift in thinking occurs between early childhood and middle childhood in which children adopt a sense of embarrassment when help is required (Newman, 2000). Again, from Newman: "Over the school years, perceived benefits and costs influence in increasingly complex ways children's decisions about whether to take the initiative and ask for help when they encounter difficulty" (Newman, 2000, p. 368).

In order to combat this developmental trend, it is essential for teachers to structure their classrooms in ways that support student autonomy, self-efficacy, and success. Any and all good

learners require an academic environment that scaffolds their knowledge on how to be independent learners and flexible problem-solvers who know how to ask for help efficiently and effectively. Classrooms that are process and effort-based rather than product and ability-based, rooted in concept understanding rather than solely on performance, are more likely to achieve this optimal learning atmosphere where children embrace challenge, persevere strategically, and ask for help when necessary (Butler, 2006; Newman, 2000; Sandoval & Lee, 2006).

Renowned psychologist Carol Dweck (2015) conceptualizes this idea in her research on the "fixed" versus "growth" mindsets (see Figure 6). The fixed approach to development offers a perspective that embraces developmental *consistency* over time and across varying situations, while the growth approach to development offers a perspective that embraces developmental *change* over time and across varying situations (Marulis, 2016). Dweck's work has found great support; so much so that she has developed an entire growth mindset intervention curriculum called "Brainology" which is "designed to teach students the understanding that their intelligence and abilities are not fixed and can be developed through effort" ("Brainology Empowers Students," n.d.). Thus far, implementation of this intervention has been met with great success ("Brainology Empowers Students," n.d.).

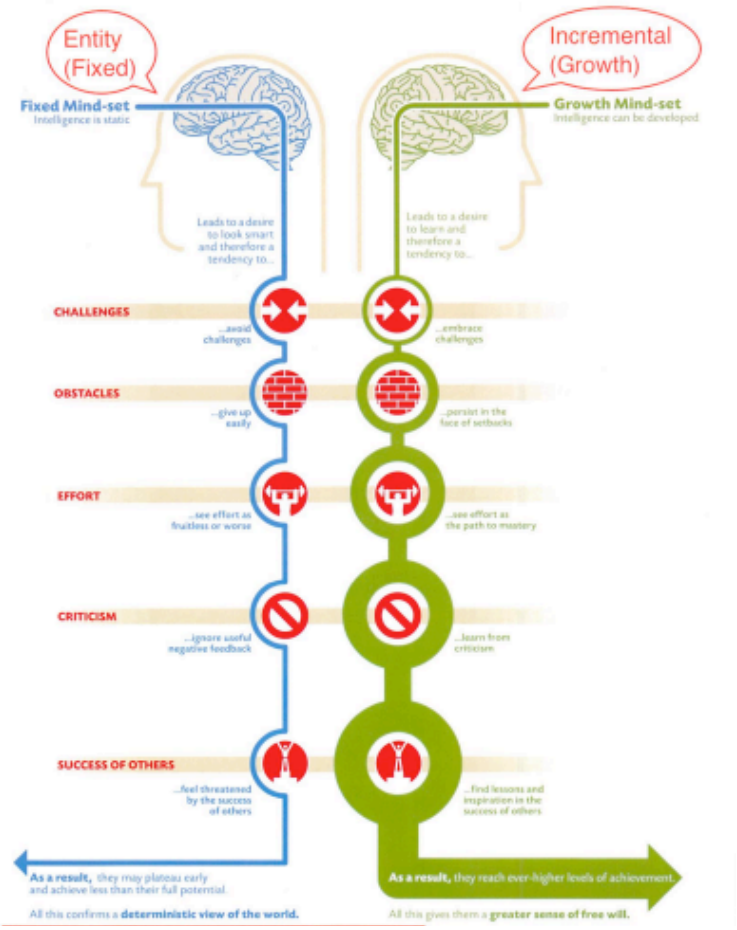


Figure 6. Growth vs. fixed mindset model. From Dweck, 2016, p. 245.

In addition to considering the impact of fostering growth mindset in their students, teachers also need to be aware of the Pygmalion/ Rosenthal effect (see Figure 7), "which is the phenomenon that explains better performances by people when greater expectations are put on them" ("The Rosenthal Experiment," n.d.). In other words, it is the effect that teachers' beliefs and actions have on students' self-perceptions of their intelligence. When a teacher views a student's intelligence as fixed/ low, the student is more likely to do poorly than if a teacher views the same student's intelligence as growth/ high. Further, teachers unconsciously provide more "extensive feedback, more approval, and kind gestures, such as nods and smiling" to students they *expect* to do well; conversely, they unconsciously "pay less attention to low-expectancy

students, seat [these] students farther away from teachers in the classroom, and offer less reading and learning material" ("The Rosenthal Experiment," n.d.). These actions, conscious and unconscious, conspicuously and inadvertently affect students' self-perceptions and academic achievement.

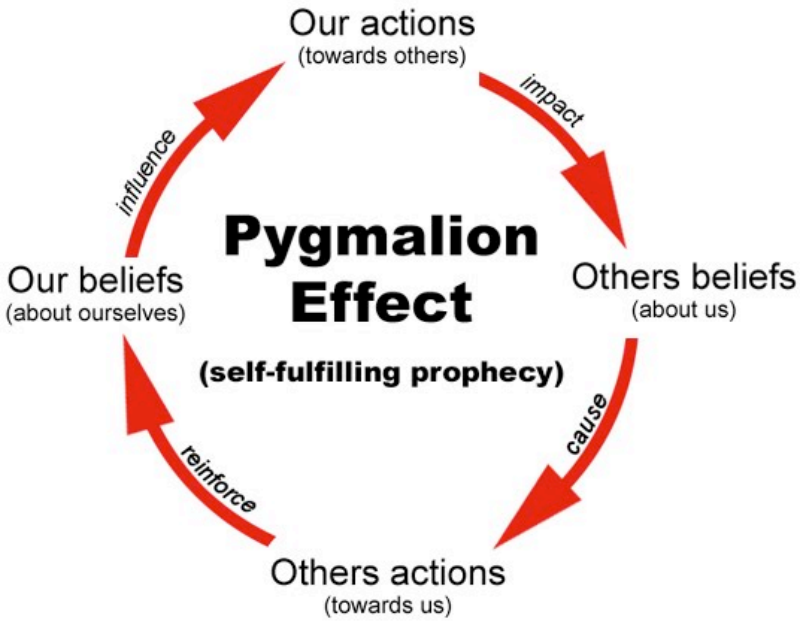


Figure 7. The Pygmalion/ Rosenthal Effect. From "The Rosenthal Experiment," n.d.

Peers

In addition to parents and teachers, research has proven that peers also mediate help-seeking behaviors. Although they are young, children, just like adolescents and adults, compare themselves to others. And, again similar to more adult situations, peer relationships among young children have the potential to be both beneficial and detrimental (Newman, 2000). Though, it is important to mention here that peer effects have different types and magnitudes of influence at different ages. Adolescents, for example, are perhaps most sensitive to peer influence due to greater emphasis on identity development during this developmental stage (Erikson, 1963).

In his research on the relation between peer relationships and help-seeking behaviors in older children and adolescents, Newman (2000) made the following conclusions: 1) "Friendships that are categorized by self-disclosure, intimacy, and mutual respect can potentially facilitate help seeking. In relationships in which children are concerned primarily with how peers view them, help seeking most likely is inhibited, except in situations in which the effect is buffered by positive characteristics of the child and his or her peer group" (Newman, 2000, p. 382). 2) Children are able to be more engaged in the classroom if they are satisfied with their friendships. 3) Attitudes towards help seeking are generally the same among friend groups (Sandoval & Lee, 2006). 4) Social comparison has the power to undercut student autonomy and help-seeking behaviors (Newman, 2000).

Unlike middle childhood and adolescence, in which peer resources become increasingly important for academic (as well as non academic) help seeking (Volet & Karabenick, 2006), Newman remarks that "preschoolers [ages 3 to 5] do not draw conclusions about their own competence or the competence of others based on comparison with peers (Frey & Ruble, 1985; Ruble & Frey, 1991)" (as cited in Newman, 2000, p. 383). In fact, he says that "social comparison provides valuable information (i.e., social referencing) that is used as a benchmark for defining performance norms and, ultimately, for improving task performance and competence" (Newman, 2000, p. 382). This is likely due to the fact that 1) young children do not fully develop a sense of theory of mind (i.e., an understanding of others' thoughts and opinions) until roughly age 4, and are therefore likely to be less affected by what their peers think, say, and do; and 2) young children tend to have "overly optimistic views of competence of both themselves and others" (Newman, 2000, pp. 383-383), which detracts from feelings of self-doubt.

Nevertheless, peer interactions during early childhood are still impactful and important to consider in the realm of help seeking. Think of, for example, a little girl Stella who is very good at puzzles. Her friend Jackson asks her for help on a challenging puzzle that he is working on. In a "beneficial" situation, Stella might say something like, *"Yeah! I can help you! I look for all the edge pieces first to make it easier."* In a more "detrimental" situation, Stella might say something like, *"Just let me do it Jackson, you're no good at puzzles."* In the first situation, Jackson internalizes positive cognitive and emotional benefits from asking Stella for help. In the second situation, however, Jackson internalizes negative cognitive and social consequences, thus dissuading him from asking for help in the future. The same theory applies for interactions between young children and their parents and between young children and their teachers.

Yet, to my knowledge, there is no empirical evidence at this time to explain the extent that peer relationships truly affect young children's academic help-seeking behaviors. In other words, in the example described above, it is not clear just how much Jackson might internalize a "beneficial" response to help seeking as opposed to a "detrimental" response to help seeking from his friend Stella. Going forward, it will be important to systematically isolate and study how peer variables may or may not affect help-seeking behaviors in young children.

We do have evidence, however, of the impact of peer relations on young children's *self-regulation*. For his dissertation at the University of Michigan, Professor Noah Neidlinger "examined ways in which children's [ages 5 to 7] individual self-regulation abilities and peer relationships impact how they co-regulate with other students during a group self-regulation assessment and a collaborative problem-solving task, as well as how teacher decisions impact these interactions" (Neidlinger, 2015, p. x). After completing two tests of self-regulation with the children and collecting teacher reports on peer relationships, Neidlinger obtained mixed results,

indicating that different tasks elicit different self-regulatory and co-regulatory strategies from young children. He did find, however, that young children are indeed influenced by their peers (see full dissertation for further explanation).

In accordance with Neidlinger's (2015) findings on the effects of peers on self-regulation, I hypothesize that peer relationships will also impact young children's help seeking and other achievement-related variables. While peers are undoubtedly more influential during elementary, middle, and high school—from deciding what clothing is "cool" to study habits—I believe that because help seeking requires more social interaction than self-regulation, even in early childhood, social contexts will impact young children's willingness and proficiency in engaging in help-seeking behaviors.

Section ii: Personal Characteristics and Individual Differences

In addition to environmental factors that span the range of Bronfenbrenner's ecological systems theory (Figure 4), personal characteristics, as well as the interactions between the environment and each individual child, are also of great importance. Consider the following:

Temperament

Temperament, defined as "constitutionally based individual differences in reactivity and self-regulation, with the term *constitutional* referring to the person's relatively enduring biological makeup, influenced over time by heredity, maturation, and experience" (Rothbart, Ahadi, & Hershey, 1994, p. 22), is highly related to help-seeking behaviors. In their research on this relationship, University of Oregon Professors Rothbart, Ahadi, and Hershey (1994) suggest that children's temperaments somewhat resemble, and are typically viewed as precursors to, the

commonly accepted "Big Five" personality traits of adults, namely Openness to experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (Chamorro-Premuzic, 2011). Further, they propose that young children exhibit the following temperaments, which they call the Big-Three Temperament Dimensions: Surgency, Negative Affectivity, and Effortful Control, which, according to Eysenck's theory of personality, "bear a strong resemblance to the superfactors of Extraversion/ Positive Emotionality, Neuroticism/ Negative Emotionality, and (to a lesser extent) Psychoticism/ Constraint," respectively (Rothbart et al., 1994, p. 22).

In their work, Rothbart et al. (1994) claim that these temperament dimensions are the foundation for young children's internal working models, self-concepts, interactions with others, and developing personalities. And they postulate that early childhood experiences affect the "working models developed by the child reflecting expectations about others, the child's optimistic versus pessimistic views of future events, and the child's perception of self in relation to others" (Rothbart et al., 1994, p. 23). Thus, each child behaves as a result of the bidirectional interactions of innate temperaments (Surgency, Negative Affectivity and Effortful Control) and varying early life experiences; all of which mediate help-seeking behaviors in young children (Rothbart et al., 1994).

In an attempt to further understand how temperament mediates young children's self-regulatory abilities, researchers Ursache, Blair, Stifter, and Voegtline (2012) executed a longitudinal study to examine "the relation of observed emotional reactivity in infancy [ages 7, 15, and 24 months] to executive functioning in early childhood [48 months]" (p. 127). Ursache and colleagues (2012) discovered that children who exhibit "high levels of emotional reactivity and high levels of the regulation of this reactivity" (p. 127) during infancy have higher levels of executive functioning regulation at age 4. Conversely, children who exhibit "high levels of

emotional reactivity but *low* levels of regulation" (p. 127) during infancy have *lower* levels of executive functioning regulation at age 4. In other words, infants' ability to regulate their emotional reactivity, which is very much related to temperament, is directly related to their executive functioning skills during toddlerhood.

How does temperament affect help seeking specifically? Rothbart et al. (1994) completed a series of tests with a small group ($N = 26$) of 10-month-old infants to address this question. Defining help seeking at this developmental stage as "behaviors directed toward others with the goal of enlisting their assistance," (p. 25), Rothbart et al. (1994) presented each individual infant with "multiple stimuli designed to elicit" (p. 28) 1) fear, 2) anger/ frustration, and 3) smiling/ laughter; each infant's responses were recorded and later coded to create a composite score for each reaction category. They concluded that help seeking is most related to individual variations in Negative Affectivity, and more specifically "to discomfort, the tendency to experience distress to sensory stimulation" (p. 35). In this study, Negative Affectivity was broken down into *irritable* negative affects such as anger and frustration ($r = .34$, $p < .05$), which *were* highly correlated with help-seeking behaviors, and *internalizing* negative affects such as fear ($r = -.17$), that were *not* highly correlated with help-seeking behaviors. In other words, based solely on temperament, individual children whose temperaments are more prone to irritable negative affects like frustration and anger are the most likely to seek help from others (Rothbart et al., 1994). Though, more research is needed to investigate the reasoning for this in young children, because there are not, to my knowledge, other follow up studies that replicate these findings.

Gender (Young Children)

Like temperament, gender, as it is understood in Western cultures, is also influential in the likelihood and willingness of a child to engage in adaptive help-seeking behaviors as a self-

regulated learning strategy. With the differences in treatment based on gender and the internalization of gender-based stereotypes (see Matthews, Marulis, & Williford, 2014) throughout the lifespan in Western culture in mind, consider the following evidence: 1) Fear of embarrassment about asking for help develops in girls earlier than in boys (Newman, 2000, p. 384). 2) "Girls have greater preferences for going to parents for academic help than boys" (Makara & Karabenick, 2013, p. 58); additionally, girls feel more "affection and affirmation of competence from teachers" than do boys (Newman, 2000, p. 368). 3) Girls, compared to boys, tend to ask for more help as tasks get increasingly more difficult (these bids for help do *not* equate to inadequate task completion) (Thompson, Cothran, & McCall, 2012). 4) "Girls surpass boys on various dimensions of attention management during ages three through thirteen" (e.g., Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006 as cited in Matthews et al., 2014). 5) Girls have better working-memory, attention, and inhibitory control compared to boys during early childhood (Matthews et al., 2014). 6) "Research demonstrates that girls surpass boys on cognitive and behavioral self-regulation but not across standardized measures of academic achievement" (e.g., Matthews et al., 2009 as cited in Matthews et al., 2014). 7) Benenson and Koulnazarian (2008) report that "girls request help more rapidly than boys across both age and socio-economic levels" (p. 167). Additionally, "among 3rd- and 5th- graders, boys and girls seek help from classmates of their same sex more frequently than from classmates of the opposite sex" (Newman, 2000, p. 380).

While it is obvious that gender socialization begins during early childhood (e.g., department stores assigning the color pink to toys for little girls and the color blue to toys for little boys), and there is plenty of evidence (e.g., Gross & McMullen, 1983) that supports the hypothesis that parents and teachers hold different expectations for boys compared to girls, and

that they respond differently to boys than they do to girls, further research on sex, gender-stereotyping, and help-seeking behaviors during *early childhood* is necessary. As of now, the existing evidence is contradictory: girls, compared to boys, are more likely to feel embarrassed and self-conscious, but are also more precocious and have more highly developed self-regulatory learning abilities. Moving forward, it will be important to carefully assess 1) how social-cultural variables (e.g., embarrassment) influence cognitive variables (e.g., self-regulation) and 2) how this interaction influences boys' and girls' willingness and adeptness in engaging in adaptive help-seeking behaviors as a self-regulatory learning strategy.

Gender (Older Children and Adults)

However, much more research on the relation between gender and help seeking exists for older children, adolescents, and adults because, as children grow older, gender socialization plays a greater role in how males and females think, feel, and act. For example, older girls begin to ask for the most help and consequently outperform older boys as well as younger boys and younger girls (Thompson, Cothran, & McCall, 2012). And, in many cross-cultural studies with *adults*, "women consistently reported more positive attitudes toward help-seeking than did men, and when responding to a variety of help-seeking situations, men reported significantly more often than women that they would not ask for help at all" (Gross & McMullen, 1983, p. 57; also see Belle, 1989; Cohen, Guttmann, & Lazar, 1998; Moeller-Leimkuehler, 2002 as cited in Benenson & Koulnazarian, 2008). Additionally, according to Benenson and Koulnazarian (2008), "research with adolescents yields identical findings" (p. 163; also see Boldero & Fallon, 1995; Schonert-Reichl & Muller, 1996; Seiffge-Krenke & Shulman, 1990 as cited in Benenson & Koulnazarian, 2008). This is consistent with the "conclusion that the condition of needing help is congruent with the feminine role and incompatible with the masculine role" in Western culture

(Gross & McMullen, 1983, p. 245; Benenson & Koulnazarian, 2008; Nadler, 1983). Looking ahead, it will be of great interest to investigate the extent that Western gender norms affect *young* children's academic help-seeking tendencies.

Age and Grade Level

Research on the relations between age and help-seeking behaviors is more prevalent, yet equally complex (e.g., Coughlin et al., 2015). As children grow and develop, their "knowledge, sources of help, willingness, concerns regarding confidentiality, levels of interpersonal openness and stigma tolerance" (Del Mauro & Williams, 2012, p. 120) change and evolve, all of which impact learning behaviors. Young children tend to have an optimistic bias about themselves and others, which often permits them to ask for help without social consequences or judgments of competency. Yet, Newman (2000) suggests that "there may be an adaptiveness to young children being overly optimistic" (p. 382) in that they are able to more freely experiment with their strengths and weaknesses in social settings. Eventually, with the development of theory of mind and the natural acculturation that happens with age, children do "develop an accurate understanding of task difficulty and an accurate internal system of self-monitoring" (Newman, 2000, p. 382).

Therefore, as children age, they begin to adopt a sense of self-awareness within their social settings (Newman, 2000; Sandoval & Lee, 2006) that can inhibit help-seeking behaviors for fear of being perceived as less intelligent (see Peers in Section i: Environmental Effects). Coughlin et al. (2015) suggest that increased age is generally associated with greater unwillingness to seek help. Interestingly, elementary age students are more likely to seek help

from a teacher over a peer in order to minimize embarrassment due to a deficit in knowledge, all of which only continues to increase in middle and high school (Newman, 2000).

On the other hand, however, age also brings the development of more advanced self-regulatory learning strategies, such as better monitoring and regulation of thinking and behavior. With greater metacognitive awareness of cognitive limitations, older students are more equipped to handle uncertain situations. In fact, "studies show a positive association between age and adaptive help seeking" (Newman, 2000, p. 365), due to developmental progressions from vague questions to specific questions, which indicate a higher level of understanding (Butler, 2006; Newman, 2000, 2006). Obviously, more research is needed to more carefully investigate how age brings both increased cognitive and metacogntive capacities as well as heightened social awareness which often impedes academic help seeing for fear of being judged.

Motivation, Self-Efficacy, and Achievement

Additionally, psychological theory has recently drawn robust connections between motivation and various aspects of learning. Whether intrinsic (for personal gain/ interest/ enjoyment) or extrinsic (for the teacher or for the grade/ reward), academic motivation is important in the classroom (Butler, 2006; Dweck, 2015; Newman, 2000).

Need

What motivates a child to ask for help? This varies on a number of accounts. We know that low and moderate levels of need (of assistance) are correlated with increased frequency of help seeking (Karabenick & Berger, 2013) because students with low need employ other effective learning strategies during problem solving tasks and so likely require less help to

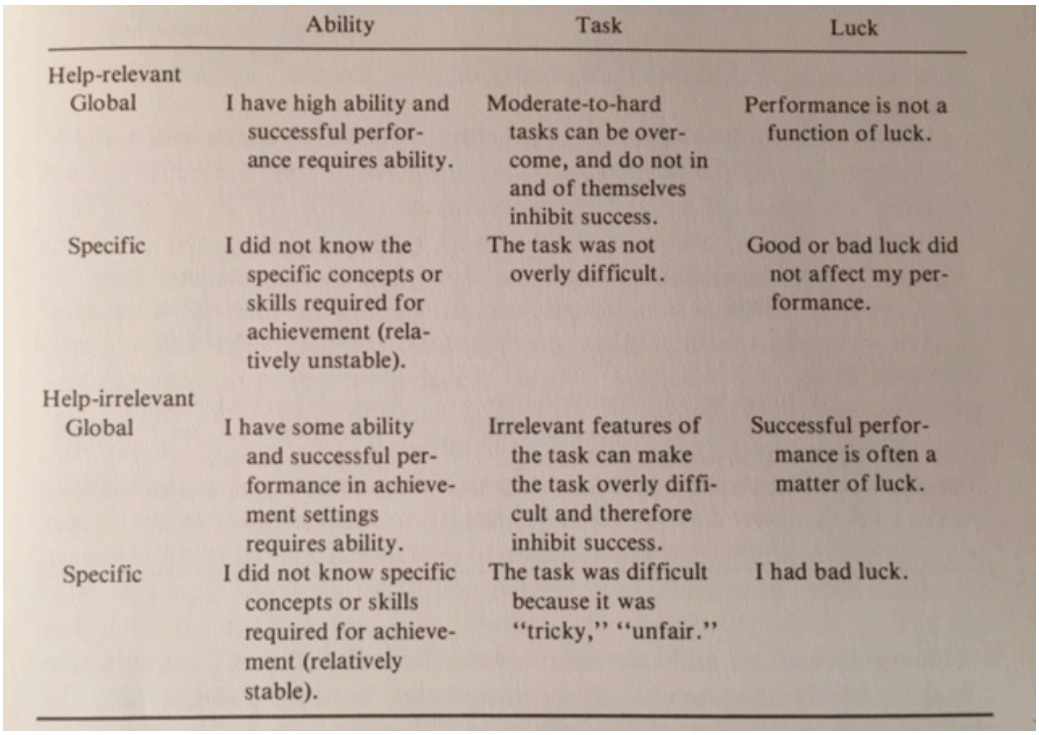
complete tasks. High levels of need, on the other hand, are *not* correlated with increased frequency of help seeking (Karabenick & Berger, 2013). Perhaps this is due to low levels of confidence and embarrassment. Also important, however, is the fact that children with high need are often not aware that they need help or have no idea how to ask (see other sections in Part II for further discussion on mediating factors in help-seeking behaviors). Karabenick and Gonida (in press) suggest that this "non-monotonic" relationship between high need and low frequencies of help seeking can largely be "attributed to metacognitive deficits due to the lack of awareness of the task situation and the relationship between the task and the learner" (p. 4) (see Part II, section ii on metacognition and Part III for further discussion of the relation between metacognition and help seeking in young children).

Attribution Theory

In addition to children recognizing a gap in their knowledge (i.e., a "need" - the extent of which mediates the frequency of help seeking) (Karabenick & Berger, 2013), they also make attributions as to why the gap (i.e., "need") exists in the first place. In a widely-cited piece, Russell Ames (1983) proposes an "attribution theory of help-seeking. . .[which] suggests that persons do a careful analysis of the causes of their performance in an effort to develop achievement strategies that address those causes" (p. 167). He suggests that attributions to "ability, effort, task difficulty, and luck" (p. 167) often drive this phenomenon, and that students who are aware of a gap in their knowledge and attribute this gap and the necessity of asking for help to external causes (e.g., task difficulty) as opposed to internal causes (e.g., lack of intelligence), are more likely to engage in help-seeking behaviors because external attributions place evaluation on something like the task rather on the self (e.g., effort and ability) (Butler, 2006; Nicholls, 1984; Shapiro, 1983).

Further, "perceptions of competence" (i.e., self-efficacy) may act as a "mediating factor in achievement settings, particularly in the choice of achievement strategies such as help seeking" (Nelson-Le Gall, DeCooke, & Jones, 1989, p. 457). Ames (1983), Nicholls (1984), and Nelson-Le Gall et al. (1989) suggest that children's self-competence and self-efficacy mediate the likelihood and frequency of asking for help because self-perceptions and attributions of success and failure ultimately define the meaning associated to this behavior.

Ames (1983) defines this further by proposing two opposing patterns of help-seeking attributions: 1) "A *help-relevant attribution* logically entails seeking help" (p. 170) because it "involves a stable and global self-concept of moderate-to-high ability, effort attributions, and a denial of excuse factors" (p. 178). 2) "A *help-irrelevant attribution* does *not* logically entail seeking help" (pp. 170-171) because it "involves a stable, global self-concept of low-to-moderate ability relying on a variety of external, uncontrollable excuse factors as the explanation for failure" (p. 178). In other words, individuals' willingness to engage in help-seeking behaviors is strongly mitigated by how self-efficacious they feel, and whether they attribute their failure (and success) to their effort and ability (*help-relevant attribution*) or to external factors outside of their control (*help-irrelevant attribution*) (see Figure 8).



	Ability	Task	Luck
Help-relevant			
Global	I have high ability and successful performance requires ability.	Moderate-to-hard tasks can be overcome, and do not in and of themselves inhibit success.	Performance is not a function of luck.
Specific	I did not know the specific concepts or skills required for achievement (relatively unstable).	The task was not overly difficult.	Good or bad luck did not affect my performance.
Help-irrelevant			
Global	I have some ability and successful performance in achievement settings requires ability.	Irrelevant features of the task can make the task overly difficult and therefore inhibit success.	Successful performance is often a matter of luck.
Specific	I did not know specific concepts or skills required for achievement (relatively stable).	The task was difficult because it was "tricky," "unfair."	I had bad luck.

Figure 8. Exemplary help-relevant and help-irrelevant attributions (uncontrollable factors). From Ames, 1983, p. 171.

Help Received

Further, when children go ahead and decide to actually ask for help, the kind of help received and the responses to help previously requested ultimately influence self-regulated learners' willingness to engage in help seeking as a problem solving strategy, especially as children age (and develop better monitoring and control skills and become more sensitive to social influences). In a help-seeking model designed for older children, Makara & Karabenick (2013) emphasize the importance of deciding whom to ask for help. They write, "depending on who or what is targeted for help, learners' perceived benefits and costs of seeking help from that source impact their likelihood of soliciting help" (p. 42). For example, if the act of help seeking does not end up benefiting a child's problem-solving process, he or she is not as likely to do it again (at least, if the child is highly metacognitive and self-regulated). Though, a child who is low in metacognitive and self-regulatory skills may not have the monitoring skills necessary to

know which strategies are effective and ineffective, and so would likely ask for help regardless of whether previous bids for help had been helpful or not. In this light, they propose "an expectancy-value model of source selection and utilization" (p. 43) (see Figure 9). It is important to note that this model has not, to my knowledge, been transferred to younger children. I plan to investigate this further in future studies, and hypothesize that young children will not fit this model as well as older children due to lesser, yet developmentally appropriate, abilities to assign expectations and evaluations of help received.

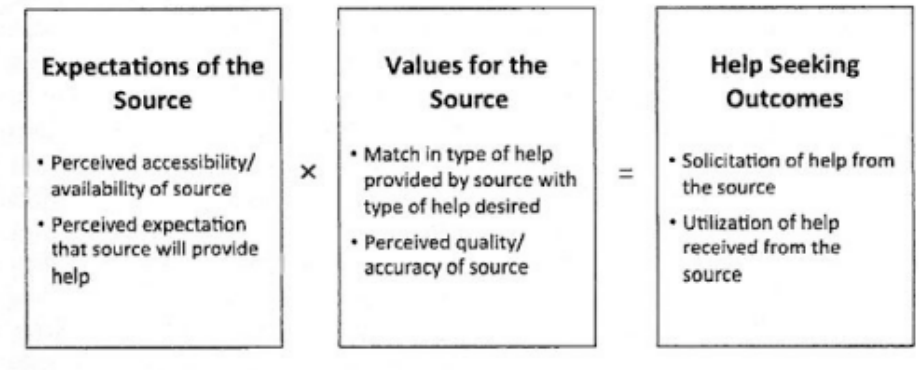


Figure 9. Expectancy-value model of source selection and utilization. From Makara & Karabenick, 2013, p. 43.

Psychological Cost and Self-Esteem

Here, on the topic of age, it is critical to consider the role of "psychological cost" (Gross & McMullen, 1983; Karabenick, 2006; Nadler, 1983; Nelson-Le Gall, 1985; Newman, 2000; Williams & Williams, 1983), which, in a nutshell, "can be classified into two general categories – personal costs related to self-esteem and self-concept, and social costs associated with interpersonal relationships and the perceptions of others" (Gross & McMullen, 1983, p. 56). As evidenced by the work of Ames (1983) and Nadler (1983), this construct develops as children age and has a complicated relationship with help seeking and self-esteem. In his work, Nadler (1983) generally understands self-esteem to be a variable that moderates one's sensitivity to "the

potential self-threatening implications of seeking help" (p. 308). In an attempt to understand this moderating effect, Nadler details the complexity of these relationships with his descriptions of two competing hypotheses on the topic of help seeking and self-esteem.

On the one hand, he describes the "vulnerability hypothesis" which posits that individuals with *low* self-esteem are less likely to seek help because they perceive the act of asking for help to be an amplification of their self-identified weakness or "vulnerability" (Nadler, 1983, p. 208); they see it "as [an] admission of incompetence and inadequacy. Especially in a culture that values achievement and rugged independence" (Gross and McMullen, 1983, p. 57). Further, these feelings of inadequacy are also often amplified by individuals' natural tendency to engage in social comparison, which, in instances requiring assistance, is often accompanied by feelings of inferiority, low self-esteem, and embarrassment (Shapiro, 1983; Wills, 1983).

On the other hand, however, he describes the "consistency approach" which posits that individuals with *high* self-esteem are less likely to seek help because they perceive the act of asking for help to be a self-threatening admission of incompetence that is inconsistent with their identity (Nadler, 1983; also see Burke & Weir, 1976; Gross, Fisher, Nadler, Stiglitz, & Craig, 1979; Nadler 1976, 1979; Siegman, 1974; Stringham, 1969; Weiss & Knight, 1980 as cited in Nadler, 1983 pp. 319-320). Additionally, Nadler remarks that these hypotheses are mitigated by "the differentiation between threat to *global* self-esteem and threat to *specific* self-esteem," that is, whether the act of seeking help is related to one's comprehensive self-concept (i.e., "global") or to a specific aspect of the self (i.e., "specific") (Nadler, 1983, p. 318). Nadler (1983) suggests that threats to specific abilities are less threatening than threats to global self-concepts. Overall, studies to date have yielded mixed results in attempts to provide conclusive evidence for one hypothesis (i.e., the vulnerability or consistency hypotheses) over the other, which points to the

complexity of help seeking as both an adaptive *and* expedient self-regulated learning strategy that is mediated by context, personal goal orientations, among other things (as evidenced by the entirety of Part II in this report) (see Butler, 2006).

Help-seeking Mindsets

In a nutshell, help seeking and help avoidance is often understood to be a result of having 1) an autonomous orientation ("i.e., on learning and understanding when seeking for help or on independent accomplishment when being reluctant to seek help") (Karabenick & Gonida, in press, p. 10), which is facilitative of adaptive/ instrumental help seeking; 2) an ability-focused orientation ("i.e., wanting to be successful or highly concerned with perceived threat to competence") (Karabenick & Gonida, in press, p. 10), which is facilitative of executive/ expedient help seeking; or 3) an expedient orientation ("i.e., focused on expediting task completion and work avoidance or on perceptions that asking for assistance will not expedite task completion") (Karabenick & Gonida, in press, p. 10), which is associated with reluctance to seek help at all (Butler, 2006).

Additionally, as described by Karabenick and Gonida (in press), children can be 1) appropriate (e.g., a child asks for help when it is actually necessary), 2) avoidant (e.g., a child does not ask for help when she is struggling), or 3) dependent (e.g., a child asks for help without even trying to solve the problem on her own) (Ryan, Patrick, & Shim, 2005, as cited in Karabenick & Gonida, in press) help seekers. Overall, students who ask for help judicially (Coughlin et al., 2015) are more likely to reap the benefits of seeking help than students who do not seek help at all, or who seek help for the sole purpose of opting out of trying altogether. Students who struggle to ask for help judicially (Coughlin et al., 2015) must acquire and develop affective-emotional and social competencies in order to be able to self-regulate when facing

challenges and seek help from affective resources in appropriate ways (Karabenick & Gonida, in press).

Finally, and as mentioned previously, researcher Carol Dweck (2015) proposes that children are trained to understand their learning with either a "growth" mindset or a "fixed" mindset (Dweck, 2015). A "growth" mindset is associated with mastery-oriented learning ("i.e., focused on understanding and improvement") (Karabenick & Gonida, in press, p. 11) and tends to facilitate the use of adaptive/ instrumental help-seeking behaviors. Teachers who encourage this kind of thinking in their students are intentional about their instruction of self-regulated learning skills, strategies, and behaviors, and therefore incorporate skill and strategy instruction into their objectives and lesson plans (Snowman & McCown, 2015). For example, teachers might "invite students to discuss and exchange their beliefs about help seeking, use role play with peers, or model the help-seeking process themselves" (Karabenick & Gonida, in press, p. 17).

A "fixed" mindset, on the other hand, is associated with performance-oriented learning ("i.e., focused on performing better than others"), performance-avoidant-oriented learning ("i.e., concerned about performing worse than others") (Karabenick & Gonida, in press, p. 11), and tends to facilitate the use of executive/ expedient help-seeking behaviors (see Figure 6). Teachers that encourage *this* kind of thinking in their students are intentional about instruction of *content* as opposed to skills and strategies. Oftentimes, this leaves students ill equipped to engage critically, meaningfully, and successfully with the very content their instructors are asking them to "learn." I use quotation marks here because how much learning really occurs when students are learning for the sole purpose of getting a good grade (Snowman & McCown, 2015)?

Of course, the motivational mindsets that teachers encourage and that students internalize are ultimately driven by contextual variables (e.g., teacher training, teacher warmth and receptivity, students' self-efficacy, and so on). Therefore, the "growth" and "fixed" mindsets are not always as black and white as they are in the preceding paragraphs. Like every other facet of human existence and development, motivational orientations, including the mindsets described above and constructs like self-esteem, embarrassment, self-competence, and self-efficacy, are driven by a combination of internal and external factors that interact in different ways, at different times, and for different people that result in the emergence of individual differences in behaviors, strategies, and skills.

Metacognitive Skills

Lastly, and importantly, metacognition (Figure 10)—generally understood to mean "thinking about thinking"—lies at the heart of these individual differences in many ways. Additionally, it has recently been linked to the strategic monitoring and control processes that are required of academic, adaptive help-seeking behaviors (Karabenick & Gonida, in press). Metacognition has been conceptualized as "an executive process that directs the functioning of other cognitive processes" (Tobias & Everson, 2002, p. 6) and is "related to the awareness of the existence of a problem, understanding that help is needed in order to overcome it, and knowing how to seek help (e.g., to ask questions" (Karabenick & Gonida, in press, p. 3). Thus, researchers Tobias and Everson (2002) claim, "if students cannot differentiate accurately between what they know and do not know, they can hardly be expected to engage in advanced metacognitive activities such as evaluating their learning realistically, or making plans for effective control of that learning" (p. 1) (i.e., employing learning strategies such as help-seeking behaviors to solve a problem). I explore this idea more fully in Part III: The MinD Project.

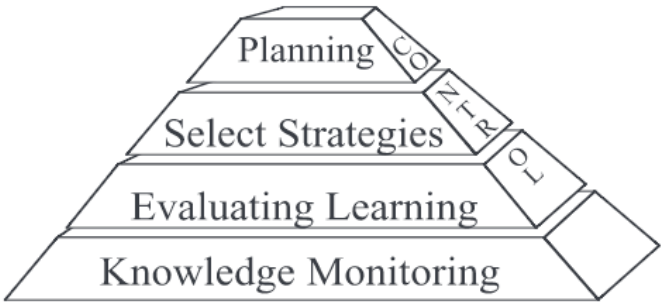


Figure 10. Componential model of metacognition. From Tobias & Everson, 2002, p. 1.

Part III: The MinD Project

Section i: MinD Overview (prior to research on help-seeking and private speech behaviors)

Aims

Though research with older children shows robust associations between metacognition, learning, and academic achievement (Bransford et al., 2000), research examining metacognitive processes and their associations to other learning skills at a young age, when it is most likely to affect subsequent developmental and academic trajectories, has rarely been undertaken (for exceptions, see work by Marulis, Palincsar, Berhenke, & Whitebread, 2016; Shamir, Mevarech, & Gida, 2009; Whitebread et al., 2007, 2009). Our research (Marulis & Nelson, 2016) represents a unique effort designed to better understand how early (prior to formal schooling) metacognitive processes—the knowledge, monitoring and regulation of cognition—emerge, how to best assess them, and what factors and learning environments optimally facilitate development and learning for young children (aged 2-5). Our goal is to provide greater insight into the importance of facilitating learning early in development (prior to formal schooling) and to determine what

methods are most effective in aiding children in their early learning. The main focus of the first study was to examine associations and predictive capabilities between metacognitive, executive function, and motivation processes in 2-5 year old children, using contextualized, developmentally appropriate, and meaningful tasks in a lab school setting.

Methodology

Participants were 61 children (*M*age= 4.11 years, *SD*= .97; 59% female) from diverse backgrounds in terms of culture, race, ethnicity, socio-economic status (SES), and language. They were from six classrooms (four preschool and two toddler) at the Connecticut College Children's Program Lab School in New London, Connecticut. Each child was individually assessed in two 15-25 minute videotaped sessions. The first session targeted metacognitive processes. First, each child was asked to complete a series of increasingly challenging Wedgits® puzzle tasks (Figure 11). Once each child was unable to complete a puzzle within 4 minutes (i.e., it was a bit too challenging), the Metacognitive Knowledge Interview (McKI) (Appendix A) was administered. Then, the Metacognitive Skills in Constructional Play Engagement (MetaSCoPE) observational coding scheme (a comprehensive measure used to assess metacognitive monitoring, regulation/control behaviors, and lack thereof, both verbal and non-verbal) (Appendix B), was applied to the video-recordings of each child to obtain an overall "metacognitive behavior score." Additionally, the Wedgits® ToT (Time on Task/ persistence/ motivation) coding scheme (Appendix C) was applied to the video-recordings to assess children's persistence, or how long each child was "on task" during their last (i.e., most challenging) Wedgits® puzzle (see Appendix E for descriptive results; the coding schemes were applied to video-taped data so that inter-rater reliability and careful coding could be administered).

Figure 11. Wedgits® puzzle task.

The second session focused on executive functioning. As described earlier, executive functioning skills are often related to metacognitive processes in children. Importantly for this study, these skills tend to be intertwined early in development and are difficult to parse apart. Thus, in order to obtain a "purer" measure of metacognitive processes across the assessment tools (i.e., McKI and MetaSCoPE), the HTKS (Head, Toes, Knees, Shoulders measure of executive functioning) task (Appendix D) was used as a covariate in the multiple regression analyses to address a specific research question about whether and how metacognitive and executive functioning skills are related. In addition, we included a measure of early language development obtained from a standardized test administered by the lab school in order to distinguish metacognitive skills from language skills.

Our key research aim was to examine metacognitive processes for their unique predictive capacities for other learning-related skills such as executive functioning, motivation, and other metacognitive constructs (e.g., metacognitive knowledge in addition to metacognitive skills and behavior). Thus, we employed a backwards stepwise regression model including the following predictors: age, MetaSCoPE, McKI, HTKS, and Wedgits® puzzle ToT. We predicted that the metacognitive skills (i.e., MetaSCoPE and McKI) would be the strongest predictors across the outcome measures.

Results

Controlling for age, the best fitting model for HTKS (Head, Toes, Knees, Shoulders measure of executive functioning) included only McKI (Metacognitive Knowledge Interview); the model fit was R^2 = .46, p = <.001. For MetaSCoPE (Metacognitive Skills in Constructional Play Engagement; a comprehensive measure to assess metacognitive monitoring, regulation/control behaviors, and lack thereof, both verbal and non-verbal), the best fitting model included both McKI (p = <.001) and Wedgits® ToT (Time on Task/ persistence/ motivation) (p = .02), R^2 = .47. For McKI, the best fitting model included age (p = <.001), HTKS (p = .002), and MetaSCoPE (p = .07), R^2 = .69. And for the Wedgits® ToT test of persistence on the puzzle task (i.e., motivation), the best fitting model included MetaSCoPE (p = .03) and age (p = .03), R^2 = .35 (see Table 1 for full regression table).

Table 1.

Contributions of metacognitive, motivational and executive functioning variables to one another.

HTKS	**R^2 = .46**	***F*(1, 50) = 42.98*** **
	β	***p***
McKI	.68	<.001
MetaSCoPE	***R*² = .47**	***F*(2, 49) = 21.37*** **
	β	***p***
McKI	.50	<.001
Wedgits ToT	.29	.02
McKI	***R*² = .69**	***F*(3, 48) = 34.63*** **
	β	***p***
Age	.45	<.001
HTKS (executive function)	.33	.002
MetaSCoPE	.20	.07
Wedgits ToT	***R*² = .35**	***F*(2, 49) = 13.00*** **
	β	***p***
MetaSCoPE	.33	.03
Age	.33	.03

Note: *** p <.001

Here, it is important to note that when examined through zero-order correlations, age was always significant with the other variables (and the same was true between all variables; each variable was significant with each other variable at the zero-order correlation level). But, as can be seen in the regression table (see Tables 1 & 2), when all variables were analyzed together, controlling for one another, other variables became more important.

Table 2.

Zero-Order Correlations

Variable	**Age**	**HTKS**	**Wedgits®ToT**	**MetaSCoPE**	**McKI**
Age	---	.572*	.510*	.631*	.770*
HTKS		---	.338	.494	.680
Wedgits® ToT			---	.533	.499
MetaSCoPE				---	.657
McKI					---

Note: * = p<.001*; n* = 51.

Significance

Overall, our predictions were supported: metacognitive processes were either unique or the strongest predictors of the learning-related skills we studied; it is not solely age that is predictive of strong learning skills or even other skills in isolation. Our results highlight the key learning-related skills that contribute to metacognitive capabilities in early childhood (Bronson, 2000).

Our results showcase what metacognitive processes are revealed by multiple assessment measures in 2-5 year olds as well as what learning-related skills metacognitive processes uniquely predict in young children. These results will contribute in critical ways to psychological and educational theory by explicating these critical developmental capacities and their relations to other early learning skills. Our goal is that results from this study will inform the design and implementation of effective interventions to enhance the learning, academic performance, and

subsequent academic achievement of young children by indicating what skills should be included in specific interventions and instruction for young children.

Section ii: Expanding the MinD Project

Just as I came on board to work on the MinD project, Professor Loren Marulis was considering additional variables that could be important to this research. In her brainstorming document "MinD Ideas," Professor Marulis wrote:

> Many of the children talked to themselves during the Wedgits about the task, particularly when it got challenging, but in a variety of ways. Some children used it to self soothe while others used it to problem-solve. And others talked about prior experiences/ knowledge. (Marulis, personal correspondence, March 15th, 2015)

Further, Professor Marulis and I noted that many of the children engaged in help-seeking behaviors as a problem-solving strategy during the task. Though, to no avail, because the task required the experimenters to intentionally refrain from responding to help-seeking behaviors vocalized by the participants so that results could represent a true indication of children's independent problem-solving and metacognitive abilities during the puzzle task.

While Professor Marulis' Wedgits puzzle task was not originally designed to measure private speech or help-seeking behaviors (there are other, more effective tasks catered to this (e.g., Coughlin et al., 2015; Vredenburgh & Kushnir, 2015), I decided to run preliminary analyses with the data that we had already collected in order to start to get an idea of how to best assess and code these complex phenomena in future studies. Fortunately, the Wedgits puzzle task is a problem-solving task, and thus naturally elicits self-regulatory problem-solving behaviors,

many of which we have already analyzed through a metacognitive lens (i.e., planning, seeking, checking construction etc.).

Moving forward, in order to re-analyze our Wedgits puzzle task video data in light of these new constructs, Professor Marulis and I worked to develop a private speech and help-seeking coding framework (Appendix F) rooted in the idea that "all speech, including social speech, has self-regulatory functions" (Winsler et al., 2005, p. 5). At this point in the project, we also collected demographic data for each participant as a result of my research on the influence of environmental factors on young children's help-seeking and other self-regulatory behavior. I am particularly interested in the relations and predictive capabilities of culture (conceptualized in our data through parental indications of their child's race) and family structure on academic help-seeking behaviors in young children. We plan to run these more nuanced analyses and obtain more contextual correlations during the summer months of 2017.

Nelson & Marulis, 2016 Private Speech Framework

While the main focus of this newer stage of the MinD project was initially driven by my particular interest in help-seeking behaviors, Professor Marulis and I also considered private speech, as it is often a close companion of help seeking during early childhood. Further, the frequency of private speech was much higher than that of help seeking during our particular task because the experimenter was purposefully nonresponsive to bids for help during the Wedgits puzzle task in order to avoid affecting the children's behavior and the data being collected. This likely dissuaded the participants from engaging in this learning strategy as often as they might in more naturalistic learning environments where bids for help are rarely ignored.

In developing our private speech framework, we were most influenced by the work of Manning and colleagues (1994). As discussed earlier in this report, private speech behaviors

have been recorded as early as 2 years of age, and tend to increase with age until about age 4 or 5 when children begin to transition from vocalized self-talk to nonverbal inner speech (Manning et al., 1994; Vygotsky, 2012). As outlined by Manning and colleagues (1994), private speech utterances were traditionally viewed as a lesser form of self-regulation due to the fact that inner speech allows for more complex thinking, planning, regulation, etc., and so is perceived to be a more advanced self-regulatory ability. Nevertheless, up until private speech behaviors begin to decrease (around age 4 or 5) due to the healthy development of inner speech, it is essential for researchers to investigate private speech utterances in early childhood in order to obtain a fuller understanding of early self-regulatory abilities.

With this in mind, and informed by Vygotsky's theories (2012), Manning and colleagues (1994) sought to further dissect private speech as a self-regulatory learning strategy, specifically as a "reflection of [a] child's cognitive [i.e., the act of thinking] and metacognitive [i.e., the act of thinking about thinking] self-guidance" during an independent task (pp. 192-193). Their "primary focus was on the content of overt speech-to-self during independent task performance in order to investigate different ways in which children verbally guide their task engagement" (Manning et al., 1994, p. 195). Their research consisted of three independent studies, all of which were coded based on a "task-irrelevant" versus a more nuanced "task-relevant" coding system (see Figure 12).

Private Speech Content Classification for Independent School Tasks

	Examples of Categories
Level 1: Task-Irrelevant (Off-Task)	
1. Affect Expression	1. "Ohhh-my hand hurts."
2. Commenting (imaginary others)	2. "Batman! Batman!"
3. Questioning	3. "I see John over there, don't I?"
Level 2: Task-Relevant (Nonfacilitative)	
4. Giving up	4. "I can't do this! I quit!"
5. Questioning	5. "Why do I have to do this stupid stuff anyway?"
Level 3: Task-Relevant (Facilitative/Cognitive Focus: Planning and Organizing)	
6. Focusing	6. "Look at my page."
7. Describing	7. "I'm making them blue lines."
8. Questioning	8. "Does this go here or here?"
9. Directing	9. "Put this line right here."
Level 4: Task Relevant (Facilitative/Metacognitive Focus: Mediation and Motivation)	
10. Correcting	10. "No, not this way! The other way! Other way!"
11. Coping	11. "It's okay. I messed up. It's okay. Don't worry. I can fix it."
12. Reinforcing	12. "Yay! I cut it just right! Nice job!"
13. Solving	13. "1-2-3-4-5-6-7-8-9-10. I made 10 straight lines in this maze. I'm right!"

Figure 12. Manning et al.'s (1994) private speech classification for independent school tasks.

They described their coding system as follows:

> Task-irrelevant (off-task) self-statements and questions constituted the lowest level *(Level 1)* because of their lack of functional significance related to task execution. . . .*Level 2* comprised task-relevant self-speech that was viewed as non facilitative; speech that functionally served to delay or stop accompanying task-related behavior. . . .*Level 3* included the task-relevant private speech determined to possess characteristics of facilitative, cognitive focus, especially aimed at planning and organizing tasks. . . .*Level 4* comprised of self-speech that goes beyond the running cognitive dialogue mentioned in

> Level 3. That is, there appears to be a metacognitive signal that serves to interrupt the planning and organizing and cognitive flow of the task in order for verbal mediational strategies to self-correct, cope, reinforce, or come to awareness of task resolution. (pp. 195-196)

The researchers employed a rigorous participant selection process in which they asked kindergarten and elementary school teachers to classify "successful learning behaviors" (Manning et al., 1994, p. 198). Their sample of teachers responded with child autonomy, academic achievement, and creativity, each of which became the basis for Manning and colleagues' series of three studies.

In each respective study, a sample of children was rated as autonomous or dependent (Study 1; $n = 147$), achieving greater academic achievement or less academic achievement (Study 2; $n = 34$), and more creative or less creative (Study 3; $n = 16$) "during school tasks assigned as independent work" (Manning et al., 1994, p. 199). Manning et al. (1994) trained the teachers to recognize and understand private speech behaviors, explaining that "a private speech unit is an audible word, phrase or sentence separated by a 3- or 4-second pause from another word, phrase or sentence" (Manning et al., 1994, p. 199). Then, the teachers and aides transcribed and recorded twenty private speech utterances from each participant during an independent task so that the researchers could code (IRR 97%, 95%, & 94% respectively) each utterance based on the coding system outlined in Figure 12.

Overall, descriptive statistics (Figure 13) and results from independent t-tests (Figure 14) indicated that the two groups in Study 1 (autonomy) and in Study 2 (academic achievement) differed significantly from one another, while the two groups in Study 3 (creativity) did not. Further, in Study 1, children classified as more autonomous used less private speech classified as

Level 1, 2, or 3, and used more classified as Level 4, than other children who are more dependent. In Study 2, children classified as more academically advanced used less private speech classified as Level 1 or 2, and used more classified as Level 3 or 4, than other children who are less academically advanced. Lastly, in Study 3, children classified as more creative via The *Torrance Test of Thinking Creatively in Action and Movement* (TCAM) used less private speech classified as Level 2 and more classified as Level 4, than less creative children; private speech utterances at Levels 1 and 3 did not reveal any significant differences between groups (Manning et al., 1994).

	Private Speech Levels							
	1		2		3		4	
Groups	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Study 1 (*N* = 118)								
More Autonomous (*n* = 59)	.5968	.6381	1.05	.6877	3.07	2.54	15.28	3.50
Less Autonomous (*n* = 59)	4.86	2.68	4.37	3.46	6.44	2.11	4.33	3.96
Study 2 (*N* = 34)								
More Academically Advanced (*n* = 19)	.1579	.5015	1.40	1.60	12.73	2.78	5.71	2.37
Less Academically Advanced (*n* = 15)	3.20	.8619	5.66	2.87	10.63	3.15	.5137	.8997
Study 3 (*N* = 16)								
More Creative (*n* = 8)	.8750	1.36	1.00	1.07	14.50	3.30	3.75	1.98
Less Creative (*n* = 8)	2.00	2.33	2.88	3.27	14.38	4.98	.7500	1.04

M = Number of utterances out of a total of 20 utterances per subject.

Figure 13. Manning et al.'s (1994) means and standard deviations by private speech levels by groups for each study.

Overall Effects of Three Studies Designed to Investigate Private Speech Usage for Independent Task Performance

Private Speech Levels by Studies	*t*	*df*	One-tailed *p*	Overall *t*	*p*
Level 1: Task-Irrelevant					
Study 1: Autonomy	−16.80	116	.001		
Study 2: Academically Advanced	−12.89	32	.001	−17.39	.001
Study 3: Creative	−1.67	14	n.s.		
Total	−31.36	162			
Level 2: Nonfacilitative Task-Relevant					
Study 1: Autonomy	−10.22	116	.001		
Study 2: Academically Advanced	−5.49	32	.001	−9.93	.001
Study 3: Creative	−2.19	14	.05		
Total	−17.90	162			
Level 3: Facilitative Cognitive Focus					
Study 1: Autonomy	−11.08	116	.001		
Study 2: Academically Advanced	2.06	32	.01	−4.96	.001
Study 3: Creative	.0805	14	n.s.		
Total	−8.94	162			
Level 4: Facilitative Metacognitive/Affective					
Study 1: Autonomy	22.51	116	.001		
Study 2: Academically Advanced	8.02	32	.001	19.91	.001
Study 3: Creative	5.37	14	.001		
Total	35.90	162			

Note. Based on Winer (1971).

Figure 14. Manning et al.'s (1994) overall effects of three studies designed to investigate private speech usage for independent task performance.

In other words, "the more autonomous, academically advanced, and creative subjects [Group 1 in each study] used significantly less non-facilitative task-relevant private speech [Level 2] such as giving up statements and helpless questioning," in favor of using significantly more metacognitive and facilitative task-relevant private speech [Level 4] such as "error detection (self-correcting), self-coping, self-reinforcing, and awareness of solutions (self-solving)" (Manning et al., 1994, p. 204). Additionally, "children designated by their teachers as

more autonomous. . . .and also those students considered more academically advanced. . . .used significantly less task-irrelevant private speech [Level 1]" (Manning et al., 1994, p. 206).

Lastly, occurrences of Level 3 private speech (i.e., private speech that is facilitative of cognitive focus) were more variable. Interestingly, "the more autonomous children used significantly less task-relevant (cognitive) private speech as compared with the less autonomous children. The more academically advanced children used significantly more of Level 3 speech as compared with the less academically advanced. No differences were found between the two creativity groups" (pp. 206-207). Manning and colleagues hypothesize that perhaps the more autonomous students were less vocal because they had already "internalized the Level 3 cognitive self-guiding processes (such as focusing) as inaudible, more autonomized guidance" (p. 205). Additionally, they suggested that a great difference may exist between "process" (i.e., autonomy) and "product" (i.e., academic achievement) during early childhood, thus explaining why the more autonomous children, but not the more academically advanced, displayed fewer Level 3 private speech utterances.

Finally, Manning and colleagues suggested that the differences in quality of private speech utterances between the two groups in each study could have easily been due to differing zones of proximal development. In other words, perhaps the independent problem-solving tasks were too challenging for the less autonomous, academically advanced, and creative students, resulting in less robust private speech utterances due to frustration. Metacognition expert Flavell writes of the zone of proximal development: "In this broad range, one knows enough to be puzzled and to formulate questions, but not enough that the processing is wholly automatic and effortlessly accurate" (Flavell, 1987, p. 28 as cited in Manning et al., 1994, p. 208).

Armed with this information, and Winsler et al.'s (2005) review of private speech in young children, Professor Marulis and I created a coding scheme that would classify children's private speech as "private speech task relevant" (PS/TR), "private speech task irrelevant" (PS/TI), or "private speech indiscernible" (PS/XX) (Appendix F) during the Wedgits puzzle task, a construction task similar to tasks used in other studies on private speech (Daugherty, White, & Manning, 1994, as cited in Winsler et al., 2005 used tangrams; Berk & Spuhl, 1995 and Winsler, De Leon, Wallace, Carlton, & Willson-Quayle, 2003 as cited in Winsler et al., 2005, used Legos). We chose to collapse the task relevant categorization process laid out by Manning and colleagues (1994) (i.e., Level 1 = Task-Irrelevant (off task); Level 2 = Task-Relevant (nonfacilitative); Level 3 = Task-Relevant (facilitative/ cognitive focus: planning and organizing; Level 4 = Task Relevant (facilitative/ metacognitive focus: mediation and motivation - see Figure 12) due to the younger age of our participants and limited differentiation of "levels" of task relevant private speech during the Wedgits task during piloting of the coding scheme.

Nelson & Marulis, 2016 Help-Seeking Framework

Initially, my inspiration for investigating help-seeking behaviors in relation to metacognition stemmed from Coughlin et al.'s (2015) study in which they use the term "introspection on uncertainty" or "uncertainty monitoring" to describe the metacognitive monitoring and control (self-regulatory behavior) required to be an adaptive help seeker. In accordance with the MinD project, Coughlin et al. (2015) suggest that very young children are capable of this metacognitive monitoring (also see Marulis & Nelson, 2016; in fact, "metacognitive research with preschoolers has demonstrated that even young children are conscious of their ongoing mental states and, in some contexts, behave strategically in response to their introspections" (Coughlin et al., 2015, p. 958). Interestingly, it is this metacognitive

"uncertainty monitoring," that has been proven to be the biggest predictor of what Coughlin et al. (2015) call "judicial help-seeking behaviors."

Coughlin et al.'s (2015) research is based off of the work previously conducted by Drs. Lyons and Ghetti (2013) in which "3-, 4-, and 5-year-olds completed a perceptual identification task in two sessions:" a "forced report" session and a "free report" session (as cited in Coughlin et al., 2015, p. 958). During the "forced-report" session, the children had no choice but to respond to each test, "which involved identifying a target object in one of two degraded images" (as cited in Coughlin et al., 2015, p. 958). During the "free-report" session, the children were given the same series of visual identification tests, but were also allotted an "I-don't-want-to-pick" option. "Confidence judgments" for each test were obtained in both sessions.

Their results revealed that during the "free report" session, the children were more likely to opt out for trials they had reported feeling uncertain about during the "forced-report" session, indicating that they were aware that their uncertainty had the potential to negatively affect their answer choice. Their "judicious withholding of uncertain perceptual decisions resulted in improvements in accuracy from the forced-report to the free-report session" (as cited in Coughlin et al., 2015, p. 958).

Coughlin et al.'s (2015) more recent study was very similar. A group of 125 3-, 4-, and 5-year-olds from upper middle-class families from Northern California with mostly European backgrounds completed the same series of tasks in a "standard report" session and a "free report" session. However, in *this* "free report" session, the children were allotted an "I-want-help" choice. The "I-want-help" choice came in the form of either a helper observed to be very competent, or a helper observed to be less competent (as demonstrated in a short film shown to the children prior to beginning the tests) (Coughlin et al., 2015, pp. 959-962).

Among other things, their results revealed that the children responded with higher confidence ratings for tests they answered correctly compared to the tests they answered incorrectly. Additionally, "participants were more confident (and more accurate) during their help session compared to their standard session, and across no-help [tests within the help session] compared to yes-help [tests within the help session]" (Coughlin et al., 2015, pp. 964-965). This provides robust evidence that preschoolers *do* monitor their uncertainty (in other words, they employ metacognitive strategies) and preschoolers *do* ask for help judicially (i.e., as a self-regulated learning strategy). Importantly, Coughlin et al. (2015) also discovered that individual differences in "theory of mind, sex, and age emerged as significant predictors of frequency of help seeking; more advanced theory of mind and being female related to more help seeking, while being older predicted reluctance to seek help" (Coughlin et al., 2015, pp. 965-966), all of which is consistent with our current understanding of help-seeking behaviors.

Inspired by this work, Professor Marulis and I turned back to the work of help-seeking expert Robert Newman. In his oft-cited piece from 2000, he writes about the differences between open and closed help-seeking questions. He writes:

> Open questions, usually formed with wh- construction, can take an infinite number of answers, whereas closed questions take a simple yes/no response (Kearsley, 1976; Shatz & McCloskey, 1984 as cited in Newman, 2000). Children learn that these two types of questions vary according to cognitive demands. Open questions (e.g., ''What am I supposed to do?'') are easier to ask than are closed questions (e.g., ''Am I supposed to count?'') because the latter type of question typically presupposes that the child possesses some already-existing knowledge about possible responses (e.g., in this case, about early numerical skills). Understandably, young children tend to ask one another more open

> than closed questions. (van Hekken & Roelofsen, 1982 as cited in Newman, 2000, p. 361)

It is this differentiation that serves as the root of the help-seeking component of our coding scheme (Appendix F). And it is with these "open" and "closed" questions that we have preliminarily attempted to differentiate between "adaptive" (Newman, 2000) or "instrumental" (Nelson-Le Gall, 1985) and "expedient" (Newman, 2000) or "executive" (Nelson-Le Gall, 1985) help-seeking behaviors in young children, summarized as follows:

> The student's goal in seeking help may be merely task completion, without comprehension or mastery as an objective [i.e., expedient/ executive in nature]. Alternatively, the student's purpose in seeking help may be to avoid criticism from an agent of evaluation, or to avoid the task altogether [i.e., expedient/ executive in nature]. Help may be sought, however, for a far more constructive purpose, such as enhancing the student's own competence [i.e., adaptive/ instrumental in nature]. (Nelson-Le Gall, 1985, pp. 66-67)

Our coding scheme sought to differentiate between expedient/ executive and adaptive/ instrumental help-seeking questions by coding each utterance of children's help seeking as either "help seeking open" (HS/O) or "help seeking closed" (HS/C). We understand open questions to be adaptive/ instrumental in nature as they put *less* of the burden of problem solving on the helper, suggesting that the *child* is primarily the one doing the "work." Similarly, we understand closed questions to be expedient/ executive in nature as they put *more* of the burden of problem solving on the helper, meaning that the *helper* is primarily the one doing the "work." By classifying bids for help in this way, it is our intention to begin to assess the frequency, associations to, and predictive capabilities of these varying help-seeking behaviors in

conjunction with all other variables in this study (i.e., metacognitive knowledge, metacognitive control, executive functioning, motivation, private speech and, future analyses with various demographic variables).

Results

To examine whether individual differences in open and closed help-seeking utterances, task relevant and irrelevant private speech utterances, metacognitive skills and behavior, executive functioning, and motivation skills (specifically persistence, or time on task, on a challenge puzzle task) would predict performance on each other, we ran a backwards stepwise multivariate regression model including the following predictors: age, HS/O (help seeking in the form of open questions), HS/C (help seeking in the form of closed questions), PS/TI (private speech that is task irrelevant), PS/TR (private speech that is task relevant), HTKS (Head-Toes-Knees-Shoulders task of executive functioning), MetaSCoPE (Metacognitive Skills in Constructional Play Engagement test; a comprehensive measure used to assess metacognitive monitoring, regulation/control behaviors, and lack thereof, both verbal and non-verbal), McKI (Metacognitive Knowledge Interview), and Wedgits® puzzle ToT (test of Time on Task/ persistence/ motivation); all of which, except age, were included as dependent variables. The best fitting model for HTKS included McKI, the model fit was $R^2 = .39$, $p < .001$. For MetaSCoPE, the best fitting model included both McKI and Wedgits® ToT ($R^2 = .47$, $p < .001$). For McKI, the best fitting model included age, HTKS, and MetaSCoPE ($R^2 = .65$, $p < .001$). And for Wedgits® ToT, the best fitting model included MetaSCoPE and age ($R^2 = .26$, $p < .001$) (See Table 3 for updated regression table).

Table 3.

Contributions of metacognitive, motivation, executive functioning, private speech, and help-seeking variables to one another.

HTKS	**R^2 = .39**	***F*(1, 74) = 46.71*** **
	β	***p***
McKI	.63	<.001
MetaSCoPE	***R*² = .47**	***F*(2, 74) = 31.94*** **
	β	***p***
McKI	.53	<.001
Wedgits ToT	.27	.005
McKI	***R*² = .65**	***F*(3, 74) = 43.65*** **
	β	***p***
Age	.42	<.001
HTKS (executive function)	.29	.001
MetaSCoPE	.25	.006
Wedgits ToT	***R*² = .26**	***F*(2, 74) = 12.74*** **
	β	***p***
MetaSCoPE	.35	.006
Age	.23	.07

Note: *** p <.001

While neither help-seeking nor private speech utterances were significant in the backwards-stepwise multivariate regression model, we discovered several important correlations. Controlling for age (n = 72): PS/TI and MetaSCoPE were significantly *negatively* correlated, r = -.23, p = .045, and PS/TI and McKI were significantly *negatively* correlated, r = -.22, p = .06. Additionally, PS/TR and HTKS were significantly correlated, r = .26, p = .03; PS/TR and MetaSCoPE, r = .25, p = .03; PS/TR and McKI, r = .28, p = .02 (see Table 4).

Table 4.

Correlations for all children controlling for age.

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. HTKS (total)	-	.28	.00	.16	.02	.26**	-.04	-.04
2. MetaSCoPE (total)		-	.40	.01	-.23**	.25**	-.16	.13
3. McKI (total)			-	.13	-.22***	.23**	-.10	.09
4. ToT (total)				-	-.08	.18	-.18	.15
5. PS/TI					-	.16	.17	-.05
6. PS/TR						-	.66	.71
7. HS/O							-	-.08
8. HS/C								-

Note: $^{*}p < .10$; $^{**}p < .05$, $^{***}p < .01$; $n = 75$.

Significance

Overall, our initial hypothesis was *partially* supported: task *relevant* private speech was positively associated with metacognitive knowledge ($r = .28$, $p = .02$), metacognitive behavior ($r = .25$, $p = .03$), and executive functioning ($r = .26$, $p = .03$). Task *irrelevant* private speech was negatively associated with metacognitive behavior ($r = -.23$, $p = .045$) and a similar trend was found for metacognitive knowledge ($r = -.22$, $p = .06$). However, neither private speech nor help seeking uniquely predicted metacognitive knowledge and behavior, executive functioning, and motivation.

Logistically, these results make sense because, as mentioned previously, the puzzle problem-solving task was not originally designed to elicit private speech or help-seeking behaviors. Specifically, the children were not prompted to ask for help if they needed it, nor were they granted help when it was requested like it was in other studies that were originally and intentionally designed to measure help-seeking behaviors (e.g., Benenson & Koulnazarian, 2008; Cluver et al., 2013; Coughlin et al., 2015; Thompson et al., 2012). These missing components likely resulted in the children producing less overall utterances of private speech and help-

seeking behaviors than would be necessary for these variables to have any predictive power over the skills that were being targeted specifically (i.e., metacognitive knowledge and behavior, executive functioning, and motivation).

Nevertheless, correlations between private speech and executive functioning, metacognitive knowledge, and metacognitive behavior suggest that the use of expressive language during problem solving tasks is an area worthy of further study. As private speech is a "tool for thinking, for communicating with the self, and for the self-regulation of behavior" (Winsler et al., 2005, p. 3), there is great promise in further researching this developmental skill. Importantly, and in accordance with the first study of the MinD project (see Part III, Section i), investigations of the relations between expressive language and metacognitive knowledge will be particularly important in designing future intervention projects.

Section iii: Final Thoughts

Unfortunately, help-seeking and private speech behaviors during early childhood, while conceptually agreed-upon by researcher and practitioners alike as important developmental skills, remain largely unexplored. Though, as is evident from the research that we *do* have on the subjects, young children have innate predispositions to learn and internalize effective learning strategies naturally and very quickly. It would be remiss, however, to say that all young children have equal tendencies and opportunities to do so. As discussed previously, individual differences in internal and external factors that affect development drastically mediate the likelihood, frequency, and effectiveness of a child's willingness and success in engaging in effective adaptive help-seeking behaviors, and many of the factors discussed in this report also likely mediate private speech behaviors.

Yet, fostering and facilitating strategic expressive language in young children is critical. It is the means by which our youngest generation learns how to command their own agency and is an important lifelong skill, determined both by the internal working models of each individual child and by shared and non-shared environments. The interactions between each child and his or her environment, the synergy of nature *and* nurture, ultimately mediate help-seeking and private speech behaviors in young children in their infancy and throughout their entire lives.

Going forward, the following questions are of great interest: Why do some children employ more private speech than others during problem solving tasks? How can we further assess the relationship between private speech behaviors and metacognitive and executive functioning skills? Further, how might we go about designing a study that facilitates the use of expressive language (private speech *and* help seeking) during a problem solving task, while at the same time allowing for the measurement of metacognitive skills, executive functioning, and motivation, which I suggest are, in fact, all related? How can we manipulate the environment to best foster private speech and help-seeking behaviors in young children? How can we best assess the internal and external factors that mediate these behaviors? And, what sorts of individualized interventions are necessary to facilitate optimal internal working models (monitoring, self-regulation, assessment of the environment etc.)?

Next Steps

During the next phase of this project, it is my hope to modify and add to our existing battery of tasks and measures to more effectively elicit and capture expressive language as a significant and related variable in the MinD project and as it is related to self-regulatory learning in general. First, I will be sure to incorporate measures of the potential mediating factors detailed in this report. To account for environmental effects (i.e., culture, parents, teachers, and peers), I

will develop or modify an existing questionnaire to obtain information on each child's 1) race, ethnicity, and whether or not his or her community puts greater emphasis on collectivism or individualism; 2) attachment style with parents, and parental responsiveness to their child's bids for help; 3) teachers' approaches to teaching (e.g., instilling mastery vs. performance orientations, growth vs. fixed mindsets, and intrinsic vs. extrinsic motivation), and general descriptions of their personality (e.g., warm and accessible as opposed to strict and off-putting) and of their classrooms (e.g., facilitative of peer collaboration, flexibility in giving children choice, etc.); 4) self-reports (and teacher and parent reports) on identifying friends in the classroom. I also hope to explore peer influences at a deeper level with reference to Neidlinger's (2015) dissertation study on co-regulation in early childhood.

To account for individual differences, I will assess each child's: 1) temperament and emotional reactivity, using the measures developed by Rothbart et al. (1994) and Ursache et al. (2012) respectively; 2) gender, age, and grade level, as reported by parents; 3) motivation (though I am not yet sure on how to best assess this; further research of measures is required); and 4) metacognitive and executive functioning skills, which are already part of the MinD project (Marulis & Nelson, 2016).

In order to assess the relations and predictive capacity of expressive language (i.e., private speech and help seeking) to metacognitive skills, executive functioning, motivation, and a wide range of environmental and personal characteristics (mentioned above), it will be necessary to create, or modify an existing task, that is intentionally designed to elicit expressive language. As previously mentioned, the private speech and help-seeking frameworks used in this study were largely influenced by the work of Coughlin et al. (2015), Manning et al. (1994), and Newman (2000). With these studies in mind, I propose to replicate Manning et al.'s (1994) study

on private speech behaviors using the classifications outlined in Figure 12 (e.g., level 1: task-relevant (off-task) private speech, level 2: task-relevant (non-facilitative) private speech, etc.). While Manning et al.'s (1994) work was done with kindergartners, I hypothesize that their design can be transferred to preschoolers, as evidenced by preschoolers' high metacognitive capacity outlined in the MinD project (Marulis & Nelson, 2016). If this turns out not to be the case after piloting of this measure with preschoolers, I will readdress developmental differences in my measures.

In Manning et al.'s (1994) study, "participants were [essentially] selected based on teachers' definitions of student characteristics that comprise successful learning behaviors" (Manning et al., 1994, p. 198) (i.e., autonomy/ dependency, high/ low academic achievement, and more/ less creative). The procedure requires teachers, aides, and researchers to observe each child while he or she is employing private speech during an independent task that is appropriately challenging (i.e., not too easy, but also not too difficult); each child is observed 20 times over a period of a few weeks, and then their private speech vocalizations are transcribed and coded based on the classification system in Figure 12. It is my hope to obtain robust results similar to Manning and colleagues (1994) that I can then incorporate into the broader MinD project (Marulis & Nelson, 2016).

Additionally, I propose to replicate Coughlin et al.'s (2015) study on judicious help-seeking behaviors during early childhood. Their procedure is as follows: a group of 3-, 4-, and 5-year-olds complete a series of visual identification tasks in a "standard report" and a "free report" session. During the "standard report" session, the participants have no choice but to provide an answer to each prompt; in the "free report" session, the participants are allotted an "I-want-help" option from a "good" helper or a "bad" helper. Participants self-report their

confidence ratings for each trial, which are later compared to their response accuracy and use of help seeking as a problem-solving strategy. In other words, this procedure allows researchers to ascertain whether preschoolers ask for help "judicially" (on tasks they report feeling *uncertain* about, which therefore do require help) or executively (on tasks they report feeling *certain* about, which therefore should not require help). In this way, I hope to be able to better differentiate between adaptive (i.e., judicious) and executive academic help-seeking behaviors in early childhood, as well as to be able to better assess the relations between expressive language and metacognitive skills, executive functioning, and a host of environmental, personal, and demographic variables.

Then, naturally, I aim to design an intervention that will enable researchers and teachers to scaffold the important developmental skills that are highlighted in this report. As evidenced by the discussion of further research directions in Karabenick and Gonida's (in press) article titled "Academic Help Seeking as a Self-Regulated Learning Strategy: Current Issues, Future Directions," there is a great need to (a) "test the effectiveness of help-seeking focused intervention programs" (Karabenick & Gonida, in press, p. 14), and (b) design "more developmental research on help seeking" (Karabenick & Gonida, in press, p. 14).

Most of the literature up to this point has focused largely on assessing academic help-seeking behaviors in older children, adolescents, college students, and adults (e.g., Makara & Karabenick, 2013; Newman & Schwager, 1993; Pusstinen, Kokkonen, Tolvanen, & Pulkkinen, 2004; Ryan & Shim, 2012; Shim, Kiefer, & Wang, 2013), and there is not, to my knowledge, a significant amount of intervention work that has been done in this area (for exceptions see e.g., Birbili & Karagiorgou, 2009; Rosenshine, Mesiter, & Chapman, 1996). While research on help-seeking behaviors during early childhood is not nonexistent (e.g., Benenson & Koulnazarian, 2008; Coughlin et al., 2015,

Cluver et al., 2013; Newman, 2000), it is not nearly enough to be able to draw robust conclusions across studies. Also problematic is the number of studies that are vague (e.g., using terms like learners, students, and people) in their descriptions of which stages of development their work is referring to.

In the MinD project, we know that metacognitive knowledge, above and beyond age, is the most critical skill in this study. Yet, as evidenced in this report, many researchers have alluded to the importance of adaptive help-seeking (and private speech) behaviors in early childhood as an effective self-regulatory learning strategy. Thus, with the design and implementation of more appropriate tasks and measures of expressive language during early childhood, I hypothesize that this, too, will be significantly related and important to consider when deigning future intervention projects.

Implications

Coming full circle on the topic of academic help-seeking behaviors in young children, I suggest the following: Ideally, "the task of classroom teachers is to help the child realize that he or she can endure academic difficulties and that seeking assistance can be an effective means for achieving success" (Newman, 2000, p. 373). Naturally, various teacher styles, personalities, and classroom activities establish different classroom contexts that variably influence students' comfort and tendency to ask for help (Newman, 2000, pp. 373- 374). Yet, as noted previously, our very culture, Western culture, hinders help-seeking behaviors in children due to values of competitiveness and independence (Butler, 2006; Newman, 2000). Additionally, Newman (2000) proposes that children experience negative setbacks from asking for help due to the age-old cultural barrier that asking for help is a sign of weakness.

Moving forward, Newman (2000) proposes that educators need to develop an awareness of social constructs that prohibit effective self-regulated learning strategies, in order to then acknowledge and combat them in favor of promoting student autonomy in the classroom. Importantly, educators must teach and emphasize that asking for help is an *effective* learning strategy when employed with the intention of receiving aid on a task that a child has tried and failed to accomplish on his or her own. Ultimately, this kind of instruction will help in implementing a sense of self-efficacy in young children that is essential to developing and maintaining other effective learning strategies (Newman, 2000).

Perhaps this simply starts with teacher feedback. Newman says that the best feedback consists of:

> (a) Providing guidance rather than answers when students respond incorrectly, (b) providing personally encouraging comments that focus on specific strengths and weaknesses in performance rather than global assessments, and (c) using individualized student progress reports rather than normed or standardized grades. (Newman, 2000, p. 377)

With this, Newman continues: "As students learn and become more knowledgeable, they become more attuned to when they need assistance and more skillful at framing questions that address their specific deficits in understanding" (Newman, 2000, p. 378). In other words, children become more metacognitive, which as the first stage of the MinD study suggests (Marulis & Nelson, 2016), is critical to the development of other important early learning skills.

I imagine that the continuation of this work will be fruitful and engaging. I am especially interested in how the idea of "cost" may or, as I hypothesize, may *not*, play such a large role in early childhood. Nelson-Le Gall and colleagues (1983) say, "although analyses of costs and

benefits may be of concern to older children who have a more stable concept of their own competence and who may be more likely to engage in social comparison, it is doubtful that they have the same importance to young children" (pp. 273-274) because young children place more emphasis on a "successful outcome than to the manner in which it was achieved" (p. 274). She does suggest, however, that "knowledge of sex-typed behavior norms may affect the decision to seek help" during early childhood (p. 274). I look forward to the further dissection of these thought-provoking suggestions.

In all, Vygotsky (2012) noted that young children employ expressive language while trying to understand new situations, find solutions to problems, and develop new plans. Moving forward, it is important to hone in on meta-skills (e.g., metacognition, executive functioning, motivation, private speech, and help seeking) during early childhood in order to optimally facilitate learning and development. Results from this ongoing study (the MinD project) will contribute in critical ways to psychological and educational theory by explicating these critical developmental capacities and their relations to other early learning skills. Ultimately, our goal is that results from this study will inform the design and implementation of effective interventions. Specifically, by highlighting cognitive, affective-emotional, contextual, and social factors (Karabenick & Berger, 2013), we will be better able to enhance the learning, academic performance, and subsequent academic achievement of young children. This includes both implicating particular research parameters such as what to include when developing interventions, as well as informing practitioners about what specific skills should optimally be included (and how they ought to be implemented) in the instruction of young children.

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Appendices

Appendix A

Metacognitive Knowledge Interview (McKI)

Name:_____Date:_____ID:_____Teacher:_____

"Thank you for working on those puzzles! I would like to talk to you about the puzzles you just did and about your thinking. My job is to learn about how kids learn and think and I have a few questions for you, Okay?" Once child assents, say**: "Thank you, there are no right or wrong answers; I only want to know what you think. Just give *your* best answer."** (If they don't agree, try to prod them by saying that 'I really need your help and want to learn about how kids think'.)

1."Do you think you did a good job, an okay job or not so good of a job on the puzzles?" Circle child's response. If they say they did a good job, ask **"What did you do to help you do a good job?"** If they answer okay or not so good, ask **"What do you think would have helped you do an even better job?**

_____
_____.

2."Did you think anything was hard?" If no, ask: **"Why not?"** If yes, ask **"Why? What would have made it easier?" Will it be harder/easier when you're older?**

_____
_____.

3."Would these puzzles be hard for another kid your age? Why/why not?"

_____
_____.

4.How did you know if you were getting the puzzles right?"

_____
_____.

"I know a kid named Gogi and he/she (use same gender as the child) **is from another land. S/he doesn't know anything about puzzles like the ones you just did. Will you help Gogi learn about these kind of puzzles?"** Wait for child to assent and say**: "Thank you."** (If they don't agree, try to prod them by saying that 'Gogi really needs your help and wants to learn about these kind of puzzles'.)

5."Would these puzzles be easier for Gogi or you? Why?"

_____
_____.

6.“What should Gogi do if s/he is having trouble with the puzzle?”

_____
_____.

7.“Would it be helpful for Gogi to talk to herself/himself about the puzzle while doing the puzzle? Why would/wouldn't that be a helpful thing to do?

_____
_____.

8.“Would the puzzle be easier with bigger or smaller pieces? Why? More/less puzzle pieces? Why?”

_____
_____.

9.“If all of the puzzle pieces were the same color, like in this picture (show the Wedgits booklet of all purple Wedgits) **will the puzzle be easier?** If yes, ask: **“Why?”** If no, ask, **“Why not?”**

_____
_____.

10. “If you think about how the pieces would fit together before I try, will the puzzle be easier? If yes, ask: **“Why?”** If no, ask, **“Why not?” What if you figured out how to do it first? Why/Why not?”**

_____
_____.

11. “If you gather the pieces you will need first and then build the puzzle, will it be easier? Why/Why not?”

_____
_____.

12. “What if you were watching TV while you were building it, will it be easier? Why?/Why not?”

_____
_____.

13. “If I close my eyes while I do the puzzle, will it be easier? If yes, ask: “**Why?”** If no, ask, **“Why not?”**

_____
_____.

“Thank you for sharing all of your ideas and how you think with Gogi!”

Appendix B

MetaSCoPE (Metacognitive Skills in Constructional Play Engagement) Coding Scheme
for *Metacognitive processes in Development [MinD]: Assessing metacognitive knowledge and behavior, and self-regulation in young children 06092016*

	Description	Example (Verbal)	Example (Non-Verbal)
MONITORING	**Awareness:** Similar to metacognitive knowledge, this involves reference to previous knowledge or current understanding *about the task*. Typically, this will include an explanation. Statements phrased as questions such as "Why do you give me all of the tricky puzzles!" can be coded as Awareness.	"This is tricky!" "This is working like this" "I need to try another piece" "I have to turn this piece to get it to fit in the middle part" "My Mom says that you should always start with the biggest pieces for puzzles"	This behavior is evidenced through children's **verbalizations only.** * An example such as "I know I need a green piece but I can't find it" qualifies because it reflects metacognitive intent/content of knowing that they NEED a certain piece to build the puzzle (i.e., awareness). Similarly, esp. for a toddler, a child may say something like: "Where's this?" (pointing at the big green square on the model card) which would qualify as it indicates awareness of knowing they need that piece but not knowing where it is. It's basically the same as the first statement, but less verbal. Most important is to ensure points are **NOT** given for higher verbal abilities only (that lack high metacognitive awareness) and points **ARE** given for low expressive vocab that shows metacognitive awareness. *However*, an example such as "Where's this go?" reflects **help-seeking**. This is not indicating/reflecting metacognitive awareness of the task but asking for help figuring out where a piece goes.
	Checking Construction: The child checks at his or her own construction. This is a deliberate pause/glance at the construction, which can include the entire construction thus far or just one part of the construction. (The child is double checking but not changing the construction).	This behavior might be accompanied by verbalizations such as "Let me have a look…"	Characterized by a clear pause and glance directed at the puzzle made so far.
	Checking Plan: The child checks at the plan (model card) before continuing building the puzzle.	This behavior might be accompanied by verbalizations such as "Let me see…"	Checking behavior is characterized by a clear pause and glance directed at model.
	Evaluation: This is a higher level process, related to Awareness, but including a judgment component. It involves appraising own competence or accuracy of construction. (See p. 109/Figure 7.1 of the Handbook of Metacognition in Education)	"I don't know how to make this one." "I did it!" "Perfect!" "I didn't do a very good job on this" "This doesn't look right" "I don't know how to do this" "Ta Da!"	The child smiles self-assuredly after finishing the puzzle (or a part of the puzzle). The child frowns **at** his/her construction. This needs to indicate an **evaluative action.** (rather than just a frown or smile related to affective responses).
CONTROL	**Change Construction:** The child changes his or her construction as a result of monitoring behaviors. The change is based on metacognitive knowledge of the model and their construction (and the alignment between them) or other monitoring factors.	"Now, I see! I need a red block" (followed by a related change made to the construction). "This doesn't look right" (then rotates pieces so they fit better/more accurately).	Child looks at the plan, then at his or her construction and deliberately makes a change to the construction. Child places a piece on her construction, which begins to topple, then she removes the piece. Child adds a piece, then looks at plan, and makes a change to the added pieces (double checking their change).
	Planning: Verbalizations that precede the actual behavior and indicate future actions.	"I'm going to do the small (or top) pieces first."	This behavior is evidenced through children's verbalizations only.
	Seeking: The child seeks materials before/ during the task or seeks the correct position of a particular piece before placing it. To be coded as Seeking, the behavior needs to include intentionality rather than just "mindlessly" grabbing a block.	"Yellow piece, yellow piece …" (while looking for the yellow Wedgit block). "I need the blue piece" (looks through the pieces and deliberately selects the blue piece). If the child only made the statement without the seeking action, this would be coded as Awareness (showing current understanding of the task and what is required).	The child looks around at different pieces, selects one and places it straight away (or doesn't find what they are looking for, but are actively seeking a piece).
	Sorting: The child sorts, organizes, groups materials or arranges the space/own construction before or during the activity.	"I will put this (the plan) on the side." "I will put these pieces over here; I don't think I need them yet"	The child takes three pieces (holding them as a group) from the top and places them on the side of the construction and continues working on the other sections. The child compares shape/color of pieces. The child groups similar pieces together.

LACK of MONITRING and CONTROL	**Brute Force:** When a piece won't fit, the child tries to force it.	This behavior is observed through the child's actions.	The child uses both hands to push a piece down. Typically, this will involve a facial expression of frustration.
	Finishing Error: The child claims to be finished when there is a major discrepancy between the puzzle he or she built and the plan (model puzzle).	"I'm done!" "Finished."	This behavior is evidenced through children's verbalizations only. OR a nod in response to the question "Are you finished?" (this is particularly relevant for a quiet child).
	Goal Neglect: The child shows awareness of error but does not act accordingly. Building incorrect **deliberately.** [A child's behavior could be coded as Seeking intentionally during a Goal Neglect; Seeking and building are different]	"This one is bigger (or a different color) than the one on the card" (but does not fix it). "I like building pyramids instead" (and builds pyramids rather than the intended picture). Says "I can't do this" (and then builds something that is clearly off task")	This behavior is evidenced through children's verbalizations only EXCEPT if child builds **more than 2 pieces** without referencing model card and construction doesn't resemble the picture (and also doesn't say anything that indicates she/he is remembering what the construction is supposed to look like).
	Repetition: The child repeats an incorrect placement; the piece *may* be "correct" but either the placement isn't correct or the piece isn't fitting. The repeated behavior/placement need to be deliberate to indicate a lack of monitoring of construction accuracy.	This behavior is observed through the child's actions.	The child takes a green Wedgits block, tries and it doesn't fit, removes it and immediately selects the same block again and places it in the same exact way/place.

Appendix C

Metacognitive Processes in Development (MinD): Assessing metacognitive knowledge and behavior, and executive functioning in young children

Instructions: For Wedgits, watch the tape (can skip around) to determine which puzzle is to be coded (Coders should code the last puzzle; in other words, the puzzle that the child works on for 4 minutes without finishing).

1. Record the starting time as right after I say "Can you make the blocks look like the blocks in this picture?". Then the ending time *should* be 4 minutes later. However, record the ending time as when you hear the beeping of the phone timer alarm.
2. ToT is coded using the computer timer (on the video software). When the child goes off-task, pause the video and record the amount of time in the "Time intervals off task" column until they return back to being on-task (for example, if they go off-task at 6:05, and then back on task at 6:15, record "6:05-6:15" in the "Time intervals off task" column).
3. Next, calculate the total amount of seconds (out of a possible 240) and record in the "TOT_1" column.
4. Then do the same again and record in the "TOT_2" column.
5. Last, average your two scores and record in the TOT_avg column.
6. If you have any questions or aren't sure about a coding or have any notes to make, record in the "Notes" column"

On task is coded when the child's visual, physical, or verbal attention is on the task in a purposeful/intentional way (for example, the child may be holding the puzzle pieces/blocks but looking at something in the distance, which would be off-task because the physical attention is not intentional). An on-task child may be actively working on the task, looking for where a piece goes, thinking about the task (either a verbalization, e.g., "I wonder how I can do this"; or a non-verbal behavior, e.g., resting his/her hand on his/her face with a thoughtful/concentrated look on his/her face or a distinct pause with an intent stare [could be at the puzzle or in the air, etc.] and a definite look of trying to figure something out with an absence of other actions/off task behaviors or verbalizations), or asking the experimenter for help (e.g., "Does this piece go here?"). Overall, **"on task"** refers to a child who is behaving in a way that indicates cognitive engagement in the task.

Off task is coded when the child's visual, physical, or verbal attention is off the task. An off-task behavior may be a child looking around the room, physically out of the chair (not engaged in the puzzle as described under "on task" behaviors), touching other objects in the room, using the task objects in a way other than related to building the puzzle (e.g., pretend play, for example, using the model card as a "credit card", or **explicitly** (i.e., articulated) building something other than the intended picture (for example, they say "I don't want to build that one, I'm going to build a pyramid instead" or "I'm not going to build that one"). The deviation from building the

goal puzzle is indicated by either a present statement (e.g., “I am making a house!”) or a retrospective statement (e.g., “Look what I made!”). [A good example of this is practice ID 710 (Dissertation research) at 3 minutes into the video]. A behavior that is **off task** would also be a child putting the puzzle pieces around their face/on their head, distracted by others in the room or talking to the experimenter about anything other than the task or a strategy related to the task (for example: “My Dad told me to organize the pieces first when I work on a puzzle”) **for 3 seconds or more.** In addition, if a child drops blocks or falls out of their chair, this is not considered off task unless it is NOT in the “service of performing the task”. In other words, if they are retrieving a piece in order to continue building the puzzle, it is **on task.** If they see something on the ground that distracts their attention to something that is not in the service of the goal of building the puzzle, then, they are **off task.** Similarly, if they fall out of their chair, that is on task unless they become distracted by the incident for **more than 3 seconds** and do not get back to the task at hand (unless they are having trouble getting back up, etc. This is for distracted attention-physical, verbal, or visual).

Appendix D

Head-Toes-Knees-Shoulders (HTKS)

General Guidelines

- **Administration:**
  - There are specific instructions to the assessor that are in *italics* and should NOT be read to the child.
  - Dialogue to be read to the child is generally located within a Text box and in **bold font,** read the dialogue aloud **verbatim**. Do not make any changes or additions to the dialogue (the only exception to this is during the practice section where assessors are prompted to provide positive feedback for correct responses.)
  - Never give feedback during the testing section (only during introduction and practice).
  - Be careful not to cue the child during the testing section. After reading aloud the instruction, look directly at the child's eyes. Do not look at his/her head, toes, knees, or shoulders.
  - Demonstrate the correct response when you see:  (during the introduction and practice sections.)
  - Do not repeat a test trial, unless the child indicates that they did not hear the instructions.
  - Do not penalize a child for *thinking* about where to place his/her hands. So long as the child does not move towards an incorrect body part before touching the correct part, then the child should receive the full 2 points.
  - Administer the task in an upbeat and positive tone. Children enjoy playing this game!
- **Testing Environment**
  - If possible, find a testing location that is quiet and in an isolated area. Ideally, no other children should be in the same room as the child being tested.
  - If parents request to sit-in during the testing section – ask parents to sit/stand quietly behind the child and out of the child's sight.
  - Have the child stand approximately 3 feet away from you. Administer the task seated or standing, but make sure that you are facing the child.
  - It is not necessary to force the child to remain in the same spot during the test, so long as the child is paying attention to you and to the task.

Scoring Guidelines

SCORE	RULE	EXAMPLE
0	Child touches the wrong body part and does not self-correct	The assessor says, "Touch your knees." The child quickly reaches up to touch her shoulders but then reverses and touches her knees, holding her hands on her knees.
1	Child makes any discernable motion toward an incorrect response but then changes his/her mind and makes the correct response	The assessor says, "Touch your shoulders." The child briefly jerks his hands upwards but then just as quickly puts his hands down and bends to touch his knees.
2	Child produces the correct (opposite) response immediately.	The assessor says, "Touch your toes." The child looks down at her toes but does not bend towards her toes. After a pause, she places both hands on her head.

PART I: INTRODUCTION

Now we're going to play a game. The game has two parts. First, copy what I do. Touch your head.

Touch your head; wait for the child to touch his/her head.

Good! Now touch your toes.

Touch your toes; wait for the child to touch his/her toes.
Repeat the two commands with motions again, or until the child imitates you correctly.

PART I: PRACTICE

Now we're going to be a little silly and do the OPPOSITE of what I say. When I say touch your HEAD, INSTEAD of touching your head, you touch your TOES. When I say touch your TOES, you touch your HEAD. So you're doing something DIFFERENT from what I say.

If the child responds correctly: Provide positive feedback on each practice item where the child responds correctly.

***If the child responds incorrectly* at any point during the practice portion, provide additional explanations up to 3 times before beginning the test portion:

Remember, when I say to touch your ____, you touch your ____, so you are doing something DIFFERENT from what I say. Let's try another one.

→ Number of additional explanations given: 0 1 2 3

A1. **What do you do if I say "touch your head"?**	0 (other than toes)	1	2 (toes)
A2. **What do you do if I say "touch your toes"?**	0 (other than head)	1	2 (head)

If the child responds verbally: "can you show me? "

Ok, let's practice a few more.

B1. **Touch your head**	0 (other than toes)	1	2 (toes)
B2. **Touch your toes**	0 (other than head)	1	2 (head)
B3. **Touch your head**	0 (other than toes)	1	2 (toes)
B4. **Touch your toes**	0 (other than head)	1	2 (head)

Proceed to Part I test section. Do not explain any parts of the task again. Do not provide feedback during the test portion.

PART I: TESTING

We will keep playing this game, and you keep doing the OPPOSITE of what I say.

	Incorrect	Self-Correct	Correct
1. **Touch your head**	0 (other than toes)	1	2 (toes)
2. **Touch your toes**	0 (other than head)	1	2 (head)
3. **Touch your toes**	0 (other than head)	1	2 (head)
4. **Touch your head**	0 (other than toes)	1	2 (toes)
5. **Touch your toes**	0 (other than head)	1	2 (head)
6. **Touch your head**	0 (other than toes)	1	2 (toes)
7. **Touch your head**	0 (other than toes)	1	2 (toes)
8. **Touch your toes**	0 (other than head)	1	2 (head)
9. **Touch your head**	0 (other than toes)	1	2 (toes)
10. **Touch your toes**	0 (other than head)	1	2 (head)

TOTAL (Self-Correct + Correct) → ☐

***If the child responds correctly (include self-corrects) to 5 or more items on Part I of the task, or if child is in kindergarten or beyond, continue to Part II.*

*If the child should **not** continue to Part II:* **Thank you for playing this game with me today!**

PART II: INTRODUCTION

Ok, now that you've got that part, we're going to add a part. Now, you're going to touch your shoulders and your knees. First, touch your shoulders.

Touch your shoulders; wait for the child to touch his/her shoulders.

Now, touch your knees.

Touch your knees; wait for the child to touch his/her knees.
Repeat the two commands with motions again, or until the child imitates you correctly.

PART II PRACTICE:

Ok, now we're going to be silly again. You keep doing the opposite of what I say like before. But this time, touch your knees and shoulders. When I say to touch your KNEES, you touch your SHOULDERS, and when I say to touch your SHOULDERS, you touch your KNEES.

If the child responds correctly: Provide positive feedback on each practice item where the child responds correctly.

***If the child responds incorrectly* at any point during the practice portion, provide additional explanations up to 2 times before beginning the test portion:

Remember, when I say to touch your ____, instead of touching your knees, you touch your ____. Do the OPPOSITE of what I say.

Number of additional explanations given: 0 1 2

C1. **What do you do if I say "touch your knees"?**	0 (other than shoulders)	1	2 (shoulders)

If the child responds verbally: "can you show me? "

D1. **Touch your knees**	0 (other than shoulders)	1	2 (shoulders)
D2. **Touch your shoulders**	0 (other than knees)	1	2 (knees)
D3. **Touch your knees**	0 (other than shoulders)	1	2 (shoulders)
D4. **Touch your shoulders**	0 (other than knees)	1	2 (knees)

Proceed to Part II test section. Do not explain any parts of the task again. Do not provide feedback during the test portion.

Now that you know all the parts, we're going to put them together. You're going to keep doing the opposite of what I say to do, but you won't know what I'm going to say.

There are four things I could say.
If I say touch your HEAD, you touch your TOES.
If I say touch your TOES, you touch your HEAD.
If I say touch your KNEES, you touch your SHOULDERS.
If I say touch your SHOULDERS, you touch your KNEES.

Are you ready? Let's try it.

	Incorrect	Self-Correct	Correct
11. **Touch your head**	0 (other than toes)	1	2 (toes)
12. **Touch your toes**	0 (other than head)	1	2 (head)
13. **Touch your knees**	0 (other than shoulders)	1	2 (shoulders)
14. **Touch your toes**	0 (other than head)	1	2 (head
15. **Touch your shoulders**	0 (other than knees)	1	2 (knees)
16. **Touch your head**	0 (other than toes)	1	2 (toes)
17. **Touch your knees**	0 (other than shoulders)	1	2 (shoulders)
18. **Touch your knees**	0 (other than shoulders)	1	2 (shoulders)
19. **Touch your shoulders**	0 (other than knees)	1	2 (knees)
20. **Touch your toes**	0 (other than head)	1	2 (head)

PART II TESTING:

TOTAL (Self-Correct + Correct) → ☐

***If the child responds correctly (include self-corrects) to 5 or more items on Part II of the task, or if child is in first grade or beyond, continue to Part III.*

Thank you for playing this game with me today!

Child ID: _____ Date: _____ 6

*If the child should **not** continue to Part III:*

PART III INTRODUCTION

You are doing so well we just have one more part! Now we are going to change the rules of the game.

When I say to touch your HEAD, you touch your KNEES.
When I say touch your KNEES, you touch your HEAD.
When I say touch your SHOULDERS, you touch your TOES.
And when I say touch your TOES, you touch your SHOULDERS.

Ok? Let's practice!

If the child responds correctly: Provide positive feedback on each practice item where the child responds correctly.

***If the child responds incorrectly* at any point during the practice portion, provide additional explanations up to 2 times before beginning the test portion:

Remember, we changed the rules. "Touch your head" means touch your KNEES – head goes with knees now. "Touch your shoulders" means touch your TOES – shoulders goes with toes.

→ Number of additional explanations given: 0 1 2

PART III PRACTICE:

E1. **What do you do if I say "touch your head"?**	0 (other than knees)	1	2 knees)
E2. **What do you do if I say "touch your shoulders"?**	0 (other than toes)	1	2 (toes)

If the child responds verbally: "can you show me? "

F1. **Touch your head**	0 (other than knees)	1	2 (knees)
F2. **Touch your shoulders**	0 (other than toes)	1	2 (toes)
F3. **Touch your toes**	0 (other than shoulders)	1	2 (shoulders)
F4. **Touch your knees**	0 (other than head)	1	2 (head)

You're doing great! Let's do a few more.

Proceed to Part III test section. Do not explain any parts of the task again. Do not provide feedback during the test portion.

PART III TESTING:

	Incorrect	Self-Correct	Correct
21. **Touch your shoulders**	0 (other than toes)	1	2 (toes)
22. **Touch your head**	0 (other than knees)	1	2 (knees)
23. **Touch your knees**	0 (other than head)	1	2 (head)
24. **Touch your toes**	0 (other than shoulders)	1	2 (shoulders)
25. **Touch your toes**	0 (other than shoulders)	1	2 (shoulders)
26. **Touch your knees**	0 (other than head)	1	2 (head)
27. **Touch your shoulders**	0 (other than toes)	1	2 (toes)
28. **Touch your head**	0 (other than knees)	1	2 (knees)
29. **Touch your head**	0 (other than knees)	1	2 (knees)
30. **Touch your shoulders**	0 (other than toes)	1	2 (toes)

After the child completes the task, say: **Thank you for playing this game with me today!**

Appendix E

MinD Descriptive Data by Age Group

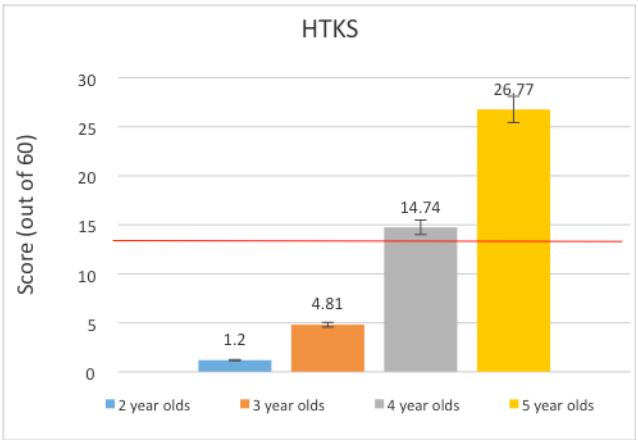

Figure 1: Head-Shoulders-Knees-Toes results of executive functioning separated by age group. Note that the red reference line indicates the mean value of HTKS for the overall sample.

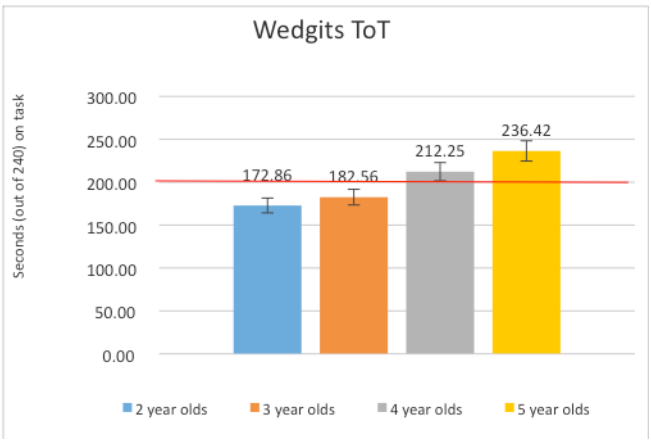

Figure 2: Wedgits Time on Task results of persistence separated by age group. Note that the red reference line indicates the mean value of Wedgits ToT for the overall sample.

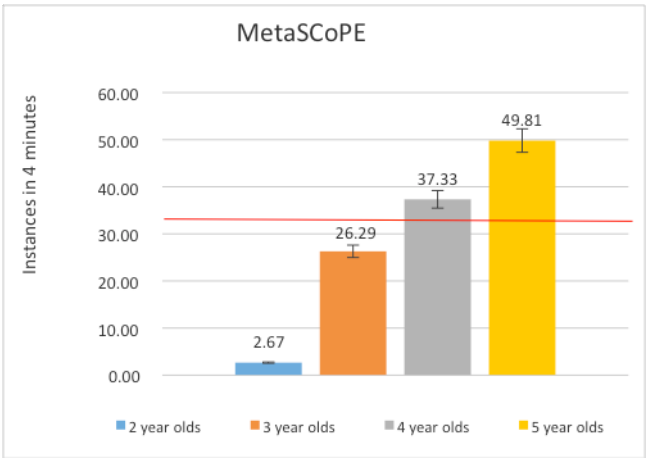

Figure 3: Metacognitive Skills in Constructional Play Engagement results of metacognition (score = monitoring + planning – lack of monitoring/ control) separated by age group. Note that the red reference line indicates the mean value of MetaSCoPE for the overall sample.

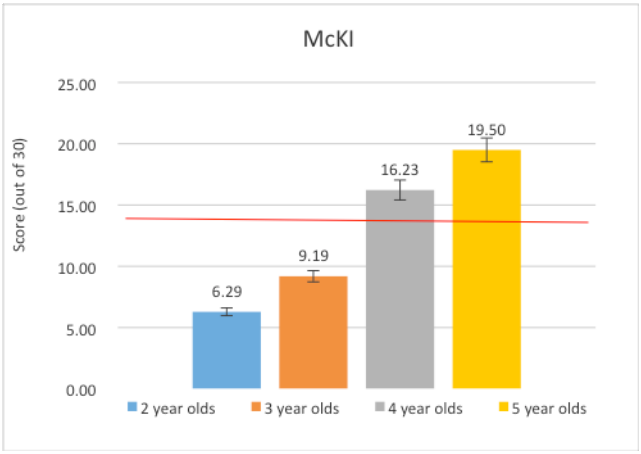

Figure 4: Metacognitive Knowledge Interview results of verbalized metacognition separated by age group. Note that the red reference line indicates the mean value of McKI for the overall sample.

Note: The red bar indicates the mean value for each assessment measure.

Appendix F

Help Seeking & Private Speech Coding & Transcriptions [2016-2017]

1. List the start time of the puzzle to be coded at the top of the each transcription.
2. Transcribe Wedgits videos; separate each utterance by numbers (1, 2, 3…).
    a. Our definition for utterance: 3 seconds between utterance = new utterance (unless utterance is obviously part of the same thought - for example, "Okay so now…….the trickiest part" would be the same utterance even if 4-5 seconds apart); if the utterance is the same (repeated phrase), code as one instance if within 3 seconds.

Label each utterance as:

- **Help Seeking (HS): Open (O) vs. Closed (C)**
    - From Newman, 2000: Open questions (e.g., ''What am I supposed to do?'') are easier to ask then are closed questions (e.g., ''Am I supposed to count?'') because the latter type of question typically presupposes that the child possesses some already-existing knowledge about possible responses (e.g., in this case, about early numerical skills).

OR

- **Private Speech (PS): Task Irrelevant (TI) vs. Task Relevant (TR)**
    - Influenced by Winsler et al., 2005 and adapted from Manning et al., 1994: TR consists of children reacting/ responding to/ about the task and/ or evaluating the task/ themselves. For example, "Holy cow!" (meaning the puzzle looks really hard) or "Okay...not again!" (referring to the puzzle falling down).
    - "Goudena (1987) defines irrelevant speech as all speech where 'the content of the utterance does not deal with the task the child is engaged in'" (Winsler et al., 2005, p.16).
    - If a PS utterance is not able to be coded as TI or TR, code as PS/XX.

Other Coding Guidelines:

- If an utterance is not able to be coded with the current scheme, code as XX/XX:
    - Socially direct speech towards experimenter.
        - Mimicking/ responding directly to something the experimenter has said.
    - If the child says something we can't understand…. If there is sufficient content to code - for example, if it is something obviously task relevant/ irrelevant -then go ahead and code. If not, code as XX/XX.
- Not every question is help seeking. It has to be directed to the experimenter; otherwise it's private speech (statements, questions).
- If there is an utterance that includes more than one kind of code, code as the "higher level."
    - XX/XX < PS/XX < PS/TI < PS/TR or HS/O < HS/C