Parental influences on children’s decisions making

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PARENTAL INFLUENCES ON CHILDREN'S DECISIONS MAKING

by

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A thesis submitted to the Department of Psychology

in partial fulfillment of the requirements for the degree of

Master of Science in Psychological Science

UNIVERSITY OF NORTH FLORIDA

COLLEGE OF ARTS AND SCIENCES

April, 2021

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Abstract

There is currently not enough research that focuses on parental influences on children's development of decision making in early childhood. During early childhood children are primarily situated in the family context and are likely learning about decision making through their interactions with parents. Previous research has suggested children begin to develop complex decisions-making skills in early childhood. Complex decision-making includes the ability to consider the future and social benefits for the self and others. Future-oriented decisions requires the difficult task of deliberating between sacrificing an instant reward for a larger reward in the future, while social-oriented decisions require the consideration of benefiting others versus yourself. The aim of this study is to evaluate the possible influences parents have on their children's future and socially oriented decision-making abilities. This study uses the sociocultural approach to cognitive development to examine this process in 90 parent-child dyads (3 to 5 years old; 47 girls). Parents and children visited the lab on one occasion. Children participated in a solitary pretest, a parent-child interaction and a solitary posttest that involved making a series of socially- and future-oriented decisions about stickers. Children received a score of 1 or 2 for each decision to share or delay (i.e., future orientation). Video data will be coded for parent behaviors (i.e. provided verbal guidance, directed child's actives, physical intervention, kept child involved in activity, displayed positive affect, displayed negative affect and engagement) and child behaviors (i.e. listened to directions, frustration with task, off-task, cooperation, display of negative affect, responsible for making decision, and engagement) on a 5-point scale (1 = to a minimal extent; 5 = to a great extent). We expected that parental responsiveness to help make decisions that consider the future (e.g., you can have one sticker now or two at the end of the game) and that consider others (e.g., you can have one sticker for yourself or one for you and one for a friend), and child task engagement and decision responsibility to be associated with children's posttest decisions to share or delay. We found that by 4-years-old children have the ability to engage in executive functions (EF) and to consider social and future-oriented decisions. We also found that parents scaffolding techniques plays a role in their children's EF development skills. Our finds also suggest that parents may have an influence on their children's decision making to either share or delay, but only when they are actively providing responsiveness.

Keywords: child development, decision making, sociocultural theory, zone of proximal development, scaffolding, guided participation,

Parental Influences on Children's Decisions Making

The purpose of this study is to examine the contributions parents make when young children are faced with decisions that involve both future and social considerations. Much of the previous research on children's decision making has focused on children's independent decision-making ability, particularly among older children and adolescents. Less is known about children's decision making skill in early childhood and how parents influence children's development of decision making, either directly or indirectly (Brocas & Carrillo, 2020). The ability to make decisions is a complex cognitive skill required in daily functioning and relies on the coordination of executive functions (Garon & Moore, 2007). Decision making skills are associated with the ability to control impulses and delay gratification (Garon et al., 2012). By controlling impulses and delaying gratification, individuals are able to simultaneously consider their present and future selves, as well as the social situation, in making decisions that will result in the most beneficial outcome. Research has found that by the age of 4, children have the ability to delay gratification and wait for a larger reward. This ability is linked to cognitive and social success in adolescence (Garon & Moore, 2004). Research has also shown that children as young as 18-months of age are capable of engaging in prosocial behaviors such as sharing (Brownell et al., 2009). The current study will examine both social- and future-oriented decision making in young children from a Sociocultural perspective.

The development of complex cognitive skills, like decision making, is influenced by social interactions with more skilled partners. These social interactions assist in the transfer of skills or ideas from the more skilled partner to the developing child. Young children are primarily situated in the family context and are largely interacting with and under the tutelage of their parents. Early decisions are taking place in this context. Therefore, it is likely that parent-child interactions that involve making social and future oriented decisions contribute to children's development of this skill. The following sections will discuss previous theory and research regarding the Sociocultural approach to cognitive development.

Sociocultural Approach

This research is influenced by the Sociocultural perspective, which emphasizes that child development is situated in the cultural context (Miller, 2002). Culture is defined as a system of shared beliefs, values, skills, customs, language, symbols, structured relationships with social practices, and social settings that can include physical setting and objects. Culture can be expressed in a number of ways, including family and societal routines and rituals. The values and goals of a culture for children's development, can influence what children think about, what skills are developed, how information and skills are learned, when age appropriate activities should be taught and learned, and who is allowed to participate. For example, Western culture encourages children to attend school to develop reading, writing and mathematics skills (Miller, 2002), while young Maasai girls in Kenya learn to care for the house and young Maasai boys are expected to take care of the livestock (Tian, 2018). Culture shapes social interactions and the psychological and technical tools required to facilitate the development of the skills children need to become competent members of their designated culture.

According to the sociocultural approach, social interaction is key to the transfer of cultural values and practices across generations. Specifically, these social interactions allow for the transfer of cultural tools, technological and psychological tools, to be passed from one generation to the next (Rogoff, 1990); tools that provide culturally valued ways of thinking and behaving. Technical tools contribute to changing objects in the environment, such as a loom that helps weave traditional Peruvian “polleras” or skirts. Psychological tools provide ways of thinking and organizing behaviors, including language, writing, counting, maps, art and even strategies used to teach (Miller, 2002). Cultures vary in the specific tools used to facilitate children’s development. For example, western cultures encourage children to attend schools that provide them the psychological tools (language, writing and counting) to develop reading, writing and math skills (Miller, 2002), whereas schools in Arab countries focus on the teachings of religion and the importance of strong family values while they learn language and writing skills (Jensen et al., 2014).

In Western societies, in early development children are largely engaged in social interactions with immediate family members, especially parents. Later in development teachers, coaches, other experienced adults and more experienced peers also contribute to development. Given the importance of the family context in children’s early development, it is especially important to understand the role that parents play in the development of decision-making. In the following section, two sociocultural perspectives will be examined with emphasis on the ways in which the social context influences cognitive development.

Vygotsky's Sociocultural Theory

Vygotsky's sociocultural theory stressed the importance of social interactions as a fundamental requirement for a child's cognitive development. Children are involved in social exchanges that contribute to their development of cognitive functions, which includes basic and higher psychological process (Gauvain & Perez, 2015). Basic psychological process are responses to different environments, while higher psychological processes are self-generated stimuli that become a behavior (Vygotsky, 1978). Higher psychosocial processes represent an adaptative development that are formed from basic psychological process and create a new psychological system. Vygotsky stressed that higher psychological processes are influenced by culture, while basic psychological processes are not (Gauvain & Perez, 2015). For example, there is a distinction between intentional memory and natural memory. While intentional memory is a higher psychosocial process that is influenced by culture (e.g, some cultures tie a string in a knot at the bottom of a chair to remember where they last put a lost item), natural memory is a basic psychological process similar to perception (e.g., knowing that tomatoes are red).

Vygotsky proposed that cognitive development is facilitated when children and more experienced partners work together within the child's zone of proximal development (ZPD) (Crain, 2000). The *ZPD* is the distance between what a child can achieve on a cognitive task while they work alone and the advances the child makes while working with a more experienced partner (Çakıroğlu, 2018). The ZPD will vary across children, with some children making great strides with assistance while others make less progress. For example, if two children independently completed a conventional intelligence test, and both scored at an eight-year-old level. After receiving information and assistance from a more skilled partner, one child scored at the nine-year-old level and one at the twelve-year-old level after retaking the test (Crain, 2000). The two children did not have the same learning potential but were both able to perform beyond their current level with the assistance provided. Thus, the ZPD is not a test of what is known, but a dynamic process that reflects children's cognitive developmental potential (Miller, 2002). Appropriately challenging children within their ZPD progresses their cognitive development and continuously prompts a change in their abilities. The following sections will further elaborate how to work with children in the ZPD.

Scaffolding technique

Working within the child's ZPD in a way that facilitates cognitive growth or improvement requires (1) identifying and working just beyond the child's current ability so that the task is appropriately difficult, (2) providing direction that states a clear goal and desired outcome and, (3) evaluating the child's ability to independently accomplish goals (Moll, 1990). One way the Vygotskian notion of the ZPD has been studied is by applying the concept of scaffolding to children's development of cognitive abilities (Perez, 2004). Scaffolding is used by the more experienced adult to help the child engage in a challenging task while working within the ZPD (Gauvain & Perez, 2015). Scaffolding is most effective when the experienced adult adjusts their interactions and cognitive support based on the child's needs and abilities. This involves consistently monitoring the child's progress to either remove support if the child improves or add support if the child continues to struggle. Six identified scaffolding techniques include, (1) gaining the child's interests, (2) breaking down a large tasks into smaller manageable tasks that are easy to understand and follow, (3) maintaining a clear goal, (4) identifying the difference between the child has completed and the end goal, (5) controlling the frustration and any risks that comes with the task, and (6) demonstrating an effective way to complete the task (Rogoff, 1990).

The ZPD can be used in terms of explicit and implicit learning. Explicit learning is conscious and a thought-out attempt to acquire knowledge or a new skill (Ellis, 2015) unlike implicit learning which is automatic, nonconscious, and occurs naturally (Mathews et al., 1989). Both explicit and implicit learning have their benefits when applied to certain developmental skills, for example form-focused language is best taught explicitly, since grammatical rules are made aware to improve communication (Ellis, 2015). The ZPD does not require all learning to be verbal, therefore cultures that encourage educational development implicitly benefit from teaching children new skills through observations (Miller, 2002). For instance, a child may learn to recycle plastic water bottles instead of throwing them in the garbage by observing their parents make that decision. This interaction between a parent and a child is possible, because of *intersubjectivity*, which is as a shared understanding that is supported by a common goal and focus between a child and adult. The ZPD not only defines how culture can influence a child's development but also the process of their development.

The original work of Wood and colleagues studied the contributions scaffolding to children's development of problem-solving skill. In one study, mothers' level of interventions was observed to determine the effects instructions had on their children's (ages 3-4) ability to complete the problem-solving activity, which was a pyramid made of connecting blocks (Wood & Middleton, 1975). Wood and Middleton (1975) described "region of sensitivity to instructions" as a measure used to determine a child's ability and readiness to receive a different type of instruction during a task. This means that the instructor asks the child to complete only one extra step at a time while performing a task. They hypothesized that there would be (1) a relation between the instructions and child's problem-solving ability and (2) the most effective type of instructions are the ones within the "region of sensitivity to instructions". The mother-child dyads were evaluated based on the mother's behavior and the child's behavior after instructions were given. Mother's behavior was rated on *level of intervention* using five categorical levels of intervention types (l*evel 1:* general verbal directions, *level 2*: specific verbal instructions, *level 3*: mother indicates material, *level 4*: mother provides material and prepares it for assembly, *level 5*: mother demonstrates an operation). Mothers were also evaluated in their *activity in the region of sensitivity to instruction*, which is the frequency of each categorical level of intervention mentioned above. Children were evaluated on their *sensitivity of the mother to feedback from the child's actives* which was based on whether the child succeed or failed as a result of the given level of intervention. Children were also evaluated during a post-instruction session on *probability of a task appropriate construction* (if they correctly connected the blocks together without the mother's help) and *probability of an error rejection* (the of ration of how many times an error was made before rejecting the block and selecting a new one). Results indicated that the most effective instructions provided by mothers were the ones provided within the "region of sensitivity to instructions". Children were more successful when mothers responded appropriately to their children's abilities and adapted the level of instructions to their child's needs. There was no correlation between the frequencies of instructions given and the child's post-instruction performance, indicating that the quantity of exposure to directions has no notable effect on children's problem-solving ability. The work of Woods and colleagues has been adapted over the years, as discussed in the following study and will be extended in this proposed investigation.

A longitudinal study examined the effects scaffolding techniques that were provided by parents had on their child's pre-mathematical development at age 2, 3 and again at age 4 (Sorariutta & Silvén, 2018). During the child's first visit (age 2), the parents' autonomy support and scaffolding technique were evaluated using an adapted coding system from Wood and Middleton (1975). Both parents were observed separately as they played with representing toys (animals, people, and furniture) with their child. Autonomy support was evaluated on a scale of 1-3 (*auto1:* The child mainly sets the goals for the activities even during moments of joint play between, *auto2:* parent supports child's independent activities, *auto3:* parent controls and restricts the child's cognitive processes and occasionally even interrupts the child's activities in order to achieve her/his own goal). Scaffolding techniques were evaluated on scale of 1-4 (*scaf1:* the parent provides subtle guidance which respects and promotes the child's goals, *scaf2*: if the parent seeks to influence the child's goals, she/he sets the new goal slightly above the child's current goal and level of performance, *scaf3*: the parent assists and guides the child when necessary by dividing the problem into smaller more manageable tasks or breaking it up step by step into smaller sub-problems, *scaf4:* the parent adjusts her/his guidance to the child's level of cognitive development). The frequencies of autonomy support and scaffolding techniques were coded on a scale ranging from 1 to 3 (1, 1.5, 2, 2.5, and 3). A score of 3 on all scales indicated that the parent was consistency with their cognitive guidance and were responsive to their child, a score of 2 signified a parent that every now and then provided responsive cognitive guidance, and a score of 1 implied the parent rarely provided cognitive guidance. Children were then given the Early Language Test to evaluate their spatial and numerical skills at age 3 and again at age 4. The Early Language Test includes six sets of four objects, all of which are toy that represent real-world objects that children should be familiar with. The children were allowed to play with each toy for 10-20 seconds and they were asked a series of questions about the items (size and shape) for the next 15 – 20 mins. Results indicated that when both, the mother and father, used scaffolding techniques and cognitive guidance their child performed better on spatial and numerical tasks. Specifically, children's who mothers provided more scaffolding guidance at the age of 2 performed better on spatial tasks age the age of 3. Children who received more scaffolding guidance for their fathers at the age of 2 performed better on spatial tasks at the age of 4. The current study also focuses on the direct influence's parents have on their child's cognitive skills, specifically FODM. We can infer from Wood and Middleton (1975) results that parents who provide scaffolding techniques, may have a direct influence on children's decision-making skills. A parent may suggest to their child the benefits of delaying gratification for the purposes of increasing rewards for either themselves or others. As exemplified in Sorariutta and Silvén's (2018) *scaf4* evaluation scale, the most optimal parent behavior influences their child's FODM, such as suggesting a new perspective slightly different from the child's current perception. The interaction between a parent's guidance and their child is also demonstrated in Rogoff's perspective on guided participation.

Rogoff's Notion of Guided participation

Another perspective that stems from Vygotsky's notion of the ZPD and expands upon the scaffolding research is Rogoff's emphasis on cognitive development reflecting a community of learners and more skilled individuals. This perspective adds to the scaffolding approach, which emphasizes the role of the more skilled partner by suggesting instead that learning and cognitive development is a process of *Guided Participation* (GP) in which both the guider and the learner are equally valued. GP involves both children and their caregivers in a collaborative process that stems from children's present understanding and involves structuring how the child will participate in activities. In order to study the effects of GP, The Radziszewska and Rogoff tested children age 9-10 using an errand-planning task that required them to map out an efficient route to collect 5 items (Radziszewska & Rogoff, 1991). This study included 20 pairs of children dyads (included two children but only one child was trained per dyad) and 20 pairs of parent-child dyads. Four types trials of were presented: pretraining trials (3 total), pretest trial (1 total), collaboration trails (2 total), and posttest trials (2 total). Children who received training completed 3 trials of pretraining, in the first trial the research assistant explained the optimal strategy to complete the errand task, and in the last two trials the children were asked to complete the optimal strategy as the assistant watched and assisted when needed. Then after a short break the same children were asked to complete the pretest independently after being reminded of the optimal strategy. Parents were also asked to complete the same pretest as the trained children. All dyads were then asked to complete the collaboration trails where they would plan two different routes together and two different routes independently. The trained and untrained children were then asked to complete the two posttests after being separated from their partner. These trials were recorded and later observed to analysis the guided participation during joint planning. To determine how partners shared responsibility of the decision-making process, they looked at whether there was a symmetrical or asymmetrical relationship. To determine the children's involvement in the decision-making process, they observed if their behavior was either *passive* (uninterested, observed without making decisions or worked on drawing routes) or *actively involved* (working symmetrically or actively following along and making suggestions). Guidance was evaluated to determine if it was either *optimal strategy* (explicit explanation of elements) or *strategic thinking aloud* (commenting about planning decisions so that it either directly or indirectly allows the partner to understand the reasoning behind a decision) were used. Dyads that included active involvement with a trained partner resulted in better posttest performance. Parents who used optimal strategy statements and strategic thinking resulted in the child performing better in the posttest. Overall, parents provided more GP and as a result those children were more involved in the planning process, compared to the children with child partners who tended to focus more on completing the task than on guiding their partners. Adult-child dyads were more beneficial to children, since adults provide verbalized GP, optimal planning strategy, and planning decisions aloud. Just as Vygotsky argued that progress in the ZPD is made possible due to intersubjectivity, Rogoff also argues GP is possible because of the shared goal and purpose between a learner and skilled induvial. GP suggest that guidance and participation are both equally valued and are necessary for children to understand their culture. Guidance can be presented in an explicit or implicit manner, while participation depends on the learner's reaction to the skilled individual. The following studies demonstrate how both explicit and implicit guidance provided by parents can influence their children's development of executive functions, specifically decision-making.

Decision-Making

As discussed earlier, decision-making is considered to be a higher-order or more complex cognitive skill that relies on the coordination of *Executive function* (EF) processes, which support purposeful actions and appropriate responses to complex or challenging situations (Hughes & Devine, 2019) and include the skills inhibitory control, working memory and set shifting. Inhibitory control is the ability to control impulses or habits and can consist of cognitive inhibition and motor inhibition (Bari & Robbins, 2013). Working memory is the process of storing and acting upon the information stored in our short-term store (Bjourklund & Myers, 2015). And, set shifting is the ability to switch between different tasks, rules or mind-sets

(Bjourklund & Myers, 2015). In line with EF development, decision making skills emerge and begin to develop in early childhood. Decision making involves generating, recognizing and evaluating behavioral options that are most suitable to complete a task or goal (Gauvain & Perez, 2005b; Kar et al., 2013). Making decisions that involve the social context or future considerations requires the coordination of these underlying EF skills which emerge in early childhood. The process of making decisions that includes others or the future self involves complex cognitive skills of both social and emotional competence. The thoughts and feelings of others need to be considered when making a decision that involves others. For example, deciding to keep the music volume low in a room of studying students. The process of making a decision for the future self requires one to delay gratification. For example, saving money in order to purchase a home. Decision making processes are difficult for children because of the amount of skills needed and benefit from receiving guidance from more skilled individuals while developing these skills. The upcoming sections will elaborate on the necessary EF needed to develop future-oriented decision-making skills.

EF skills are associated with development in the prefrontal cortex of the brain and children's environmental factors, such as their learning experiences provided by culture and parents (Bjourklund & Myers, 2015). From the ages of 2 to 5 years of age, the dorsolateral prefrontal cortex is developing, with individual differences in executive functions noted among children by 3 years of age (Conway & Stifter, 2012). During this 3-year interval of development, executive functions are influenced through parental interactions making it an ideal time to evaluate how parent interactions can also affect children's decision-making skills. Vygotsky identified that higher order processes are voluntary automatic reactions that are developed through the help of parents, or others, during social activities (Conway & Stifter, 2012). Higher parental responsiveness, which is the sensitive and contingent responses to children, predicts greater EF in children (Merz et al., 2017). For example, parents who provide verbal stimuli, warm, positive, and responsive have been found to longitudinally predict inhibitory control in children, while parents that negatively control, are power assertive and take over tasks have been found to predict poorer delay inhibitory control.

As suggested above, decision making requires the use of inhibitory control. Inhibitory control can include both cognitive control (i.e., control of thoughts and perceptions) or behavioral control (i.e., response inhibition, deferred gratification). Most young children struggle to inhibit behavioral responses, but as children age their inhibitory control progresses (Bjourklund & Myers, 2015). In addition to developmental changes in inhibitory control, individual differences in this skill are also evident in early childhood as demonstrated by the classic Marshmallow Task by Shoda, Mischel and Peake (1990). In the Marshmallow Task experiment Children (mean age: 4 years, 4 months) were presented with a single marshmallow but were told they could have two if they were able to wait for the researcher assistant to come back in the room. Results indicated that children who delayed gratification were more likely to have self-control, control temptation, be more intelligent and less likely to get distracted ten years later. These findings suggest that by the age of four years, children display variation or individual differences in inhibitory control functions that may have long-term implications for development. These individual differences may also be evident in decision-making among children.

Decision making also involves working memory. Working memory in children is often identified by their ability to maintain declarative information (ex: state capitals) for a short period of time (van ’t Wout et al., 2019). Children begin to develop working memory at the age of 2 and by the age of 5 working memory abilities can even be tested to predict academic performance (Bjourklund & Myers, 2015). In a study conducted, children aged 5- 6 were evaluated in their working memory and language (Veraksa et al., 2020). The children's verbal working memory was assessed by the "sentences repetition" test, which required participants to repeat 17 sentences that increased in complexity. If sentences were accurately represented, participants received 2 points; if they made 1 or 2 errors, they received 1 point; if 3 errors were made, 0 points were awarded. Language was evaluated by using the "Story Retelling" method. Children were told they will hear a story and would have to retell it. Children were provided up to three opportunities to hear the story and retell it. Their findings suggested that children's working memory was related to lexical and grammatical accuracy in the "Story Retelling" test. While completing both tests, we can infer that levels of decisions-making have occurred. Children had to decide which words or phrases to retrieve from their working memory. Therefore, similar to inhibitory control and working memory, decision-making skills also being to develop during this period of childhood.

Set shifting, also known as switching, is the ability to easily shift between tasks, a set of rules or mind set (Hughes & Devine, 2019). In Zelazo, et al (1996) Dimensional Change Card Sorting Task (DCCS), children were asked to sort cards by their shape, the cards were either pictures of cars or flowers (Bjourklund & Myers, 2015). The 3 and 4-year-old children were able to complete this task. Then the children were asked to sort the cards by color, yellow cars and flowers in one pile and red cars and flowers in another. Most 3-year old children continued to sort the cards with the first rule, which was shapes, even though they were aware of the new rule. The 4-year-old children were able to switch to the new set of rules of sorting by color instead of shape. From this study we can also assume that by the age of 4 children have the capability to consider and apply the decisions-making skills needed to switch between tasks, rules and mind sets.

As previous studies have shown, by the age of 3 the underlying EF skills needed to make complex decisions have begun to emerge and advance. For example, Moffett et al. (2020), in an extension of the famous Marshmallow Task described above, found that children as young as 3 to 4 years old were capable of making a complex decision. In this study children were told by a reliable experimenter (returned with reward) that they could either have one marshmallow now or wait for the experimenter to return and receive two marshmallows. Not only were the children able to make the complex decision of benefiting their future self, but they were also more likely to wait longer when a reliable experimenter was present. Additional research has examined children's independent future and socially oriented decisions directly. For example, Thompson et al. (1997) designed a sticker task to examine children's (aged 3-5) future-oriented decisions that were "prudent" (benefit the self) or altruistic (benefit others). Children were presented with multiple options to either receive one sticker now or two later, some options included cost, no cost, share or delay gratification. Overall, results suggested that between 3 and 4 years old, children were able to make future-oriented decisions. However, there was a difference between the type of decisions children are more likely to make at 3 and 4 to 5 years old. 3-year old's are less likely to make prudent and altruistic decisions compared to 4- and 5-year old's. This implies that there is an age-related development in prudent and altruistic future oriented decision making that occurs at age 4. The following study also shows that 4 year old children that chose to delay gratification are more cognitively and socially developed in adolescence and perform better academically and have better control with stress and frustration (Garon et al., 2012).

Similar to the current study, Garon et al. completed a variation of Thompson et al. (1997) sticker task with 2-4 year old's, adding to our current understanding of the development of future-oriented decision making (Garon et al., 2012). They were interested in the age difference between 2-4-year-old children's choice to delay gratification when the quantity of reward increased. According to Garon, self-control requires two EF process: (1) the "hot system" which is made up of bottom-up and motivational system, and (2) the "cool system" which is made up of top-down and effortful system. When the "hot system" and "cool system" work together, effectively children are able to wait longer and delay gratification. For example, when faced with choosing to delay gratification for a larger reward, children have to consider both the quantity of the reward, which involves the bottom-up or motivational system, and the delay of the reward, which requires the top-down or effortful system. Results indicated that all age groups increased decisions to delay gratification as the quantity of reward increased. However, there was an age difference between which systems were more predominate when making the decision to delay gratification. Since 2-year old's have an underdeveloped "cool system", they are unbale to process the benefits of delaying gratification. Therefore the 2-year old relied on their "hot system" to consider the quantity of the reward. By age 3, the development of the "cool systems" begins to integrate with the "hot system" allowing children to care for the future self. They are able to make decisions for the future self as long as there is not cost for the present self. By age 4, children have developed an interactive balance between "cool systems" and "hot systems" and are able to make a decision that benefits present and future needs. Taken together, these findings suggest that children have the ability to make decisions that require them to consider others and to delay gratification, but the ability to do so will increase across the years of early childhood. The previous research discussed also suggests that there may be individual differences in certain aspects of decision making, such as the ability to delay gratification. Currently, there is little research that considers all possible aspects of the contributions made to these developments. While development of the prefrontal cortex during this developmental period is certainly an important part of the process, children's socialization experiences and learning opportunities while making decisions in the family context likely also play a role. Children must be provided with tools to develop decision-making skills; therefore, it is necessary to add to the scarce existing research on parental influences on children's decision making-skills.

Sociocultural Influences on Decision Making

Parental Influences on Executive Functions.

To our knowledge, there is currently no research on parental influences on children's decision making, but we can infer similar results based on existing research examining parental support and EF. Previous studies have demonstrated that the development of children's cognitive abilities can be influenced by their environment and trained to them through parental support (Bornstein & Lamb, 2015). Existing research has revealed that the cognitive support parents provide relates to children's individual differences in EF (Hughes & Devine, 2019). During the development of EF, parental guidance during actives can help children perform tasks independently (Gauvain & Rogoff, 1989). In a recent study, the bidirectional relationship between parental responsiveness and EF processes in children aged 3-5 were evaluated (Merz et al., 2017). At two separate occasions, 6.5 months apart, parent-child dyads were observed during a 10-minute free play session that included standard toys. At the end of both free play sessions, parents' responsiveness was coded on a scale ranging from 1 (almost never) to 5 (almost always) on the following behaviors : warm acceptance (degree that parents praised and encourage the child, showed physical affection and acceptance towards the child's needs/interests), contingent responsiveness (degree that parents responded promptly, sensitivity, and contingently to their child's cues, followed the child's lead/ pace and engaged flexibly with their child's interests), and verbal scaffolding (degree to which provided helpful language according to the child's developmental needs). Then children were asked to complete a delay inhibition (gift-delay-wrap, gift delay bow) and conflict task (bear-dragon). The results indicated that children had a positive change in delay inhibition and conflict EF after 6.5 months, when parents provided higher levels of responsiveness. These findings suggest that parental responsiveness may be a crucial factor to children's overall EF development, but specifically their delay inhibition and conflict development. Our current study evaluates parents verbal and non-verbal responses to their children's FODM, which we predict similar results to Merz et al. (2017) study.

In a 13 month longitudinal study, parent-child dyad interactions were observed to assess parent and child's EF and children's verbal ability (VA) (Hughes & Devine, 2019). Hughes and Divine's goal was to study positive and negative parental influences on children's EF to determine if individual parental measures have an exclusive association with their children's EF and to evaluate parental influences on children EF, specifically their VA. Results indicated that negative parent-child interactions (include negative affect, criticism and control) showed an inverse association with child EF, while positive parent interaction, such as scaffolding, showed a positive association with child EF. In a different longitudinal study, mother-child dyads interactions were observed to find that sensitive and supportive parenting during early childhood is associated with better child academic performance and social behavior. Another longitudinal study, evaluated two parents households cognitive guidance and scaffolding techniques to determine the contributions on children's pre-mathematic outcomes (Sorariutta & Silvén, 2018). At age 2 parents autonomy support and scaffolding behavior was evaluated, then children's numerical and spatial skills were tested at ages 3 and 4. Results indicated that children who received more scaffolding directions and cognitive guidance from their parents at age 2, performed better on spatial and numerical tasks, respectfully. Taking these findings into consideration, we can infer that parental support that involves positive interactions and scaffolding techniques have a positive effect on their child's academic and social skills and the effects on decision-making should be no different.

In Hughes and Devine (2019) study, children ages 3-5 were asked to complete various EF evaluative task, including the DCCS task described above, at two separation occasions a year apart. During the first visit, parent-child dyads were observed completing three jigsaw puzzles together. Negative parent-child interaction was evaluated using a 7-point rating scale, ranging from none to exclusive/constant on the following items: negative control, negative affect and conflict. Parental scaffolding was also evaluated and sorted into different categories: level 1orientating verbal suggestions, level 2 suggestions about specific pieces or location or actions, level 3 verbal solutions, level 4 direct physical solution, and level 5 physical demonstrations. The child's reaction was coded as either "success" or "failure". The data shows that children performed better on the DCCS task in the post-switch phase and overall results indicated that negative parent-child interactions had an inverse association with their child's EF, while parental scaffolding had a positive association with their child's EF. Taken together, these findings on the individual components of EF suggest that parental behaviors have a direct influence on their child's EF development. As seen in the previous studies discussed, parents that are responsive, provide GP and use scaffolding techniques positively influence their children's EF. Similar parental behaviors will be observed in our current study to determine if parental behaviors can also influence children's FODM.

Parental Influences on Decision Making.

Cultures encourage cognitive skills that are beneficial to their social setting (Gauvain & Perez, 2005a). The average parents in western cultures teach their child to make good decisions, even more so to behave prosaically and to diverge from inappropriate behaviors (Bornstein & Lamb, 2015). Research has suggested that not only do EF's influence children's development of decision making, but parental relationships do too (Wong et al., 2019). A positive, warm and supportive parent-child relationship is the result of consistent and responsive parenting, also known as mindful parenting (MP). As explained by the model of MP, there are five parts to parent-child interactions: (1) listening with full attention, (2) non-judgmental acceptance (3) emotional awareness, (4) self-regulation in parenting relationship, and (5) compassion. This parent-child relationship influence children's independent regulatory abilities that assist decision-making (Wong et al., 2019). Both MP and scaffolding techniques are necessary factors to considered when predicting the influences parents have on their children's decision-making skills. While scaffolding techniques assist children's learning progress, MP assist parent-child overall relationship.

The Present Study

The main focus of this study to examine parental influences on children's decision-making skills. Parent-child dyads will complete a variation of the Thompson et al. (1997) and Moore et al. (1998)(Thompson et al., 1997) sticker task. The parent-child interactions will be evaluated using various observed behaviors in a set of trials. Our first goal is to determine if there will be a change in shared and delayed decisions made after the parent and child interact. First, we hypothesize that parents who display higher levels of providing verbal guidance, high levels of positive affect, but lower levels of negative affect, while keeping their child involved will result in their child making more shared or delayed decisions. We also predict that parents who provide high levels of directing their child's activities and physically intervening will have no effect on their child's overall decision making. Our second goal is to determine if there is a change in decision making depending on whether the child or parent is mainly responsible for completing the task together. We expect that if the parent-child dyads equally share responsibility for completing the task, then the child's shared or delayed decision making will increase.

Method

Participants

This study was part of a larger IRB approved investigation that examined decision making in relation to child planning and child emotional development therefore, the data used for this study was previously collected. The current study includes 90 child and parent dyads, with 43 boys, 47 girls, 81 mothers and 9 fathers. Only one parent was asked to participant in the study with their child. The children range in age from 3 to 5 years (*M* = 3.88, *SD* = .791, see Table 1).

Table 1
Age of Participants

Child's age	Frequency	Percent
3	34	37.8
4	33	36.7
5	23	25.6

Note. Frequency and Percent of children participants age range

Participants were recruited from Duval County's Public Schools early childhood programs and local preschools within a 15-mile radius of the University of North Florida. Flyers were also placed on social media, Craig's List, libraries, museum and other local locations to assist with the recruitment of participants. The sample represents the demographic of the families in the designated recruitment area as shown in Table 2. The ethnicity of the children was determined by parent ethnicity. If parents reported different ethnicities, the child was considered other/mixed.

Table 2
Ethnicity of Children

Ethnicity	Child Participants
White/Caucasian	65.6%
Other/Mixed	27.8%
African American/ Black	2.2%
Asian	2.2%
Latino/ Hispanic	2.2%

Note. Percentage of participants ethnicity was determined using the mothers and father's reported ethnicity.

Families' social economic status was determined by referencing's Hollingshead 4-factor index and calculating the Social Strata of mothers and fathers, with percent of distribution shown in Table 3 (Hollingshead, 2011). The Social Strata was determined by considering each parent's educational level and occupation and averaging their score. The table demonstrated that 51% of the parents were *Major business and professional*, which mirrors the 53.3% of parents that reported their annual family income as $90,000 - $150,000 or more. 85.6% of the parents were married, 7.8% were single/ have never been married, 4.4% are divorced and 2% were separated. 81.1% of the mothers were still married to the father of their child, 4.4% were married to someone else, and 14.4% did not report.

Table 3

Percentage of Parents Social Strata

Social Strata	Parents
Major business and professional	51.1%
Medium business, minor profession, technical	26.7%
Skilled craftsmen, clerical, sales workers	4.4%

Machine operators, semiskilled workers	1.1%
Unskilled laborers, menial service workers	0%

Note. Social Strata is determined by using Hollingshead scoring of parent's educational level and occupational score.

Measures

Parent Survey

Parents completed a survey that collected information about the family's background. Questions focused on dates of birth, years of education, marital status, family income, ethnicity, work scheduled and professions, number and ages of children in the family, and children's preschool and daycare experiences.

Decision-Making Sticker Task

Child Pretest. Participants completed a sticker task based on Thompson et al. (1997) and Moore et al. (1998). Children first completed a solitary pretest, in which the child made decisions by themselves in the following categories; 1) Sharing without cost (PTSWOC) ("Would you like to have one sticker now or one sticker for you and Jane/Jim now?"); 2) Sharing with cost (PTSWC) ("Would you like to have 2 stickers for yourself now or would you like to have one sticker for yourself and one for Jane?"); 3) Delay for self (PTDFS) ("Would you like to have one sticker for yourself now or two stickers for yourself at the end of the game?"); and 4) Delay for other (PTDFO) ("Would you like to have one sticker for yourself now or one for you and one for Jane at the end of the game?"). Each of the four categories were presented two times for a total of 8 trials. The categories were presented in two blocks with one category type in each block (sharing or delay) in random order. A random order of blocks was presented to each participant. Participants were introduced to a gender-matched puppet named Jane or Jim and were asked to imagine Jane or Jim as a friend that loves stickers. The child and puppet were both given their own sticker book and an envelope. When the child decided to save a sticker for the end of the game, the sticker was placed in their respected envelopes. When the child decided to have the sticker now, the sticker was placed into the sticker book. One point was given to the child if they decided to share without cost and delay for self. Two points were given to the more difficult decision: share with cost and delay for others. Sharing with cost and delaying for others requires children to consider others and the future.

Parent-Child Interaction. Immediately following the pretest, parents were asked to participate with their child in making decisions. The dyads were presented with four categories (sharing without cost (PCSWOC), sharing with cost (PCSWC), delay for self (PCDFS), delay for other (PCDFO). One point was given to the dyads if they decided to either share or delay.

Child Post-test. Immediately following the parent-child interaction, children were asked to complete a solitary post-test with the same procedures as when their parents were present. Children were presented with the same four choices categories as the pretest (sharing without cost (PSSWOC), sharing with cost (PSSWC), delay for self (PSDFS), delay for other (PSDFO) two times for a total of eight trials. One point was given to the child if they decided to either share or delay. All three sessions were video recorded.

Decision-Making Coding

Parent-child dyad interactions will be evaluated using a 5-point scale that was adapted from a similar coding system used in a study by Perez and Gauvain (2009). To determine inter-rater reliability, 20% of the recorded sessions will be coded by three independent coders. Each behavior will be coded in the child pre-test, parent-child interaction and post-test using a 5-point scales ranging from 1 (minimal extent) to 5 (great extent). Parent's interaction (see table 4) behaviors were assessed by observing the following behaviors: provides verbal guidance, provides non-verbal guidance, directs child's activities, physical intervention, keeps child involved in activity, display positive affect, display negative affect, listens to directions, and engagement. Child's interaction behaviors (see Table 5) were measured by observing their involvement in task, frustration, if they are off task, displayed positive, negative affect, and responsible for making decision. The same child interaction behaviors were measured in the pretest, parent-child interaction, and child post-test. When the parent was absent the interaction between the research assistant was observed and when the parent is present only the parent child interaction was observed**.**

Table 4
Parent Behaviors

	Description	Example
Provided Verbal Guidance	To what extent did the parent verbally explain the task or provide information and suggestions about how the task should be performed in regard to future-oriented or sharing decisions	"If you wait until the end of the game you will get more stickers than if you take it now." "It is better to share."
Direct child's activities	To what extent did the parent demand or order the child	"Put that down." "Choose the two stickers for later."
Physical intervention	To what extent did the parents physically intervene in the task	Took the sticker book or envelope away from the child, held the child's hands to keep them from reaching for the sticker
Keeps child involved in activity	To what extent did the parent keep the child involved in the task either using suggestions or prompts	"Let's play with that later and make a decision now", "come sit so we can fnish"
Display positive affect	To what extent did the parent display positive behavior/emotion toward the child	"Good job", positive nonverbal behaviors (e.g., smile, gives thumbs up, laughing)
Display negative affect	To what extent did the parent display negative behavior/emotion toward the child	"Just pick!" "You're not doing this right." harsh nonverbal behaviors (e.g. grabbed arm, harsh tone of voice).

Engagement	To what extent was the parent engaged with their child in completing the task.	Actively interacted, made suggestions, commented on their decisions

Table 5
Child Behaviors

	Description	Example	Evaluated
Frustration with Task	To what extent was the child frustrated with the task	"I don't want to do this anymore" "Why are you asking me the same questions over and over?" "Can we play a different game now?" or nonverbal behaviors (e.g., sighed, rolled eyes, put head in hands or on table, grunted or yelled in frustration)	Pre-Test Parent-Child Posttest
Off-Task	To what extent was the child disengaged, made irrelevant comments, moved around the room or was looking at something else	"I have Legos at home", picks up a toy, is looking around the room when being talked to.	Pre-Test Parent-Child Posttest
Cooperation	To what extent did the child cooperate with directions or guidance from the mother or research assistant	Changed decision based in input from parent; engaged in behaviors or stopped engaging in behaviors as directed by parent or research assistant	Pre-Test Parent-Child Posttest
Display of Positive Affect	To what extent did the child display positive behavior/emotion toward the parent or the research assistant	Making eye contact, smiling and enjoying collecting stickers	Pre-Test Parent-Child Posttest
Display of Negative Affect	To what extent did the child display negative behavior/emotion toward the parent or the research assistant	Negative comments (e.g., "No mom, I can do it myself" I don't want to do it that way" "Leave me alone"),	Pre-Test Parent-Child Posttest

	Description	Example	Evaluated
		harsh tone of voice or other negative behaviors (e.g., throws something at parent/researcher, hits, turns back on parent/researcher)	
Responsible for Making Decision	To what extent was the child responsible for making decisions when their parent was present		Parent-Child
Engagement	To what extent was the child engaged in the task (e.g., asking questions, cooperating, listening)	"I can really take this home?", "Do you like stickers too?" Appears to be thinking about choices.	Pre-Test Parent-Child Posttest

Procedure

Parent-child dyads participated in a single occasion hour long study in the Cognitive Development Lab at the University of North Florida's Psychology Department. Participants provided their own form of transportation to the lab. Once participants arrived, parents were provided both written and verbal description of the study and asked to sign informed consent documents prior to participation. Children were provided a description of the study's activities and asked for their assent to participate. Parents were asked to stay in a laboratory Observation room to complete a demographics form and survey on a computer using Qualtrics with guidance provided by a research assistant. Children were directed to an adjacent laboratory Experimental room to complete the collection of observational data with guidance by a separate research assistant who administered the observational tasks. Once the child participant and research assistant were in the Experimental room, video recording of the session began. Parents were able to view but not hear their child's activities via video feed from the Observation room. As part of the larger research project, various tasks were completed before the children began the sticker task. Children first completed the solitary pretest, then parents joined their child in the Experimental room for the parent-child interaction. After completing the sticker task, parents returned to the Observation room to continue working on the Qualtrics survey. After the parent exited the Experimental room, the child completed a solitary posttest. If all observational tasks were completed before the parent finished the Qualtrics survey, children colored or reads books with the research assistant. Once the survey and observational tasks were completed, the family was compensated $25, and the children were able to take home their sticker book and envelope of stickers.

Analysis

Our analysis plan includes a variety of statistical test such as, repeated measure analysis, correlations, and regressions. Repeated measure analysis was conducted to test if behaviors and decisions changed across all three trials. Correlation's analysis was used to examine association between parents and child behaviors and child's decisions. Hierarchical regressions were also used to examine the degree to which parent and child behaviors predicted decision making during the parent-child interaction and the child posttest.

Results

Power Analysis

Data was analyzed using hierarchical regression analyses and Multivariate ANOVA. Power analysis for Multiple Regression that included 6 predictors and with alpha restricted to .05 indicated a minimum sample size of 97 participants for 80% power to detect a conservative effect size of f2 = .15. For Multivariate ANOVA analyses, detecting a conservative effect size of

$r2 = .09$, a sample size of 100 participants would result in approximately 75% power. These power analyses indicate that our sample size was sufficient to conduct all planned analyses.

Data Reduction

To reduce the number of parent behavior variables used in analyses composites of behaviors theoretically expected to reflect parental active instruction were created. The reliability among the parent behaviors (*provided verbal guidance*, *directed child's actives, kept child involved* and *engagement*) was calculated resulting in Cronbach's alpha of .84. These behavior codes were averaged together and used in further analysis as the composite *Parent Responsiveness* variable. The remaining parent behaviors, physical intervention, positive affect and negative affect, were used separately in analyses.

To reduce the number of child behaviors composites of behaviors theoretically expected to reflect active learning were created. Children's score for *off-task* behavior was reverse coded to represent children's *on-task* behaviors. The reliability among child's *cooperation*, *engagement*, and *on-task* behaviors during all three test sessions was calculated resulting in Cronbach's alpha of .84. These behaviors were averaged together for the pretest, parent-child interaction, and posttest and used in analyses as the composite *Child Involvement* variable. All other child behaviors were analyzed separately.

Differences in Child Behavior Across Trials By Age And Gender

To test whether children's behaviors during the task changed across trials and whether those changes varied by child age and gender, a repeated measures analysis o*f* variance, with child age and gender as between subjects' variables and child behaviors across the pre, interaction, and posttest trials was conducted.

Results indicated a multivariate between subjects' effect for child age, F (8, 162) = 2.852, $p < .01$, η2 = .12, but not for child gender, F (4, 80) = 2.147, $p = .083$, η 2 = .10, though this gender effect did approach significance. Examination of the univariate between subjects' effects indicated that there were age differences in *involvement*, F (2, 83) = 7.533, $p < .05$, η2 = .154, frustration, F (2,83) = 3.751, $p <.05$, η2=.083, *positive affect*, F (2, 83) = 3.708, $p < .05$, η2 = .082, and *negative affect*, F (2, 83) = 4.057, $p < .05$, η2 = .089. And, there were gender differences in *involvement*, F (1, 83) = 6.973, $p < .05$, η2 = .078, but not for frustration, F (1,83) = .127, $p = .723$, η2=.002, *positive affect*, F (1, 83) = .519, $p = .731$, η2 = .001, nor *negative affect*, F (1, 83) = .006, $p = .941$, η2 = .001.

Means indicated (see Table 6) that older children were more involved, less frustrated, displayed more positive affect and less negative affect. Examination of the post-hoc pairwise comparisons showed a significant difference between 3- and 5-year old's ($p < .05$) average *involvement*, 4- and 5-year old's ($p < .05$) average *frustration*, 3- and 5-year old's ($p < .05$) average *positive affect*, and between 3- and 5-year old's ($p < .05$) average *negative affect.* Analysis of the means and pairwise comparisons indicated that girls (M = 4.29, SD = .09) were more involved compared to boys (M = 3.95, SD = .09), $p = .01$.

Table 6

Means of Children's Behaviors by Age

Child Behavior	**Age**	*M*	*SD*
Involvement	3	3.86	.739
	4	4.07	.600
	5	4.45	.339
Frustration	3	1.45	.499
	4	1.48	.596

	5	1.14	.243
Positive Affect	3	3.16	1.05
	4	3.42	.843
	5	3.84	.797
Negative Affect	3	1.28	.355
	4	1.20	.363
	5	1.04	.115

Results also indicated a multivariate within subjects' effect indicating that child behaviors, regardless of age or gender, changed across trials, F (8,76) = 11.135, $p < .001$, η2 = .540. There were no multivariate within subjects' interactions with child age, F (16, 154) = .628, p =.857, η2 = .061, or gender, F (8,76) = .960, p = .474, η2 = .091. Examination of the within subjects' effects indicated that regardless of child age or gender, there were differences across trials for *involvement*, F (2, 166) = 20.904, $p < .01$, η2 = .201, *frustration*, F (2,166) = 21.868, $p < .01$, η2 = .209, and *positive affect*, F (2, 166) = 17.437, $p < .01$, η2 = .174, but not *negative affect*, F (2, 166) = 2.573, p = .079, η2 = .030, though this effect approached significance.

As represented in Table 7, means indicated that children were significantly more involved during the pretest (trial 1) than during the parent-child interactions (trial 2) ($p < .05$) and the posttest (trial 3) ($p < .01$), significantly less frustrated during the pretest compared to the parent-child interaction ($p < .05$) and during the posttest ($p < .01$). Children also displayed significantly more positive affect behaviors during the parent-child interaction compared to the posttest ($p < .01$) and showed significantly less positive affect behaviors during the posttest compared to the pretest ($p < .01$) and parent-child interaction ($p < .01$). There was no significant difference between trials and children's display of negative affect behaviors.

Table 7

Means of Children's Behaviors by Trial

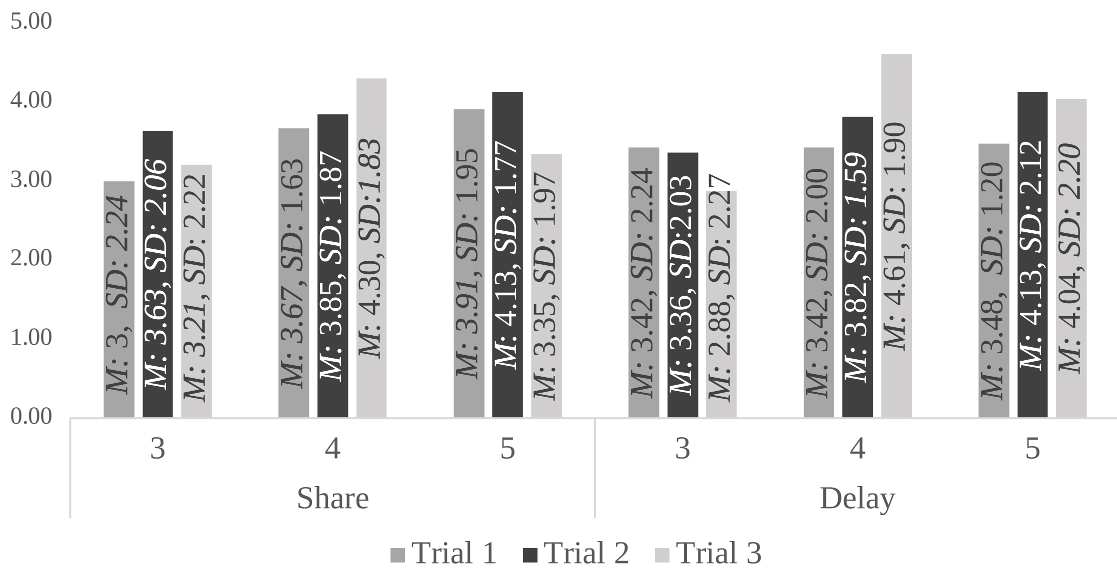
Child Behavior	**Trial**	*M*	*SD*
Involvement	1	4.37	.638
	2	4.07	.818
	3	3.83	.837
Frustration	1	1.06	.232
	2	1.36	.727
	3	1.74	.995
Positive Affect	1	3.57	1.17
	2	3.63	1.03
	3	3.10	1.02
Negative Affect	1	1.09	.388
	2	1.24	.523
	3	1.25	.570

Differences in Child Decisions Across Trials By Age And Gender

To test whether children's decisions changed across trials and whether those changes varied with child age and gender, a repeated measures analysis of variance, with child age and gender as between subjects' variables and child decisions to either share or delay across the pre, parent-child interaction, and posttest trials was conducted. There was no main between subjects' effects for child age, F (4,166) = .950, p = .437, $\eta 2$ = .022, or child gender, F (2, 82) = 1.571, p = .214, $\eta 2$ = .037. There was also no main within subjects' effects for children's decisions across trials, F (4, 80) = 1.217, p = .310, $\eta 2$ = .057. However, there was a significant trial x child age interaction, F (8, 162) = 2.341, p <. 05, $\eta 2$ = .104. Examination of the univariate effects indicated that the trial x child age interaction held for decisions to delay, F (2,166) = 3.178, p < .05, $\eta 2$ = .071, but not decisions to share, F (4, 166) = 1.891, p = .114, $\eta 2$ = .044. Examinations of the means (shown in Figure 1) indicated that whereas 3-year-old children deceased their decisions to delay across trials with the lowest number of decisions to delay in the posttest, 4-year-old children increased their decisions to delay across trials, with the highest number of decisions to delay in the posttest, and 5-year old children increased decisions to delay between the pretest to the parent-child interaction and maintained a similar level of decisions to delay in the posttest.

Figure 1

Children's Average Decisions by Age and Trial



Associations Between Parent and Child Behaviors

To examine associations between parent and child behaviors, a correlation matrix was completed as shown in Table 8 below. Child's age was positively correlated with their *involvement* in the pretest, parent-child interaction and posttest. Age was also positively correlated with children's *positive affect* during the parent-child interaction and posttest. Their age was also negatively correlated with *frustration* in the parent-child interaction and negatively correlated with *negative affect* in the parent-child interaction. Child's gender was positively correlated with *involvement* during the pretest and posttest. Parents *physical interventions* was positively correlated with children's *frustration* during the parent-child interaction. *Physical* *intervention* was also negatively correlated with children's *involvement* during the parent-child interaction and posttest. *Physical intervention* was also negatively correlated with children's *responsible for making decisions* during the parent-child interaction. Parents *positive affect* was positively correlated with children's *positive affect* during the parent-child interaction. Parent's *negative affect* was positively correlated with children's frustration in the pretest. *Negative affect* was also negatively correlated with children's *responsible for making decisions* during the parent-child interaction. *Negative affect* was also positively correlated with children's *negative affect* during the posttest. *Parent responsiveness* was negatively correlated with child's age. *Parent responsiveness* was also positively correlated with children's *frustration* during the pretest and parent-child interaction. *Parent responsiveness* was negatively correlated with children's *involvement* during the pretest, parent-child interaction, and posttest. *Parent responsiveness* was also positively correlated with children's negative affect during the parent-child interaction. Lastly, *parent responsiveness* was negatively correlated with children's *responsible for making decisions* during the parent-child interaction.

Table 8

Correlations Between Parent and Child Behaviors

Child Behaviors	**Parent Behaviors**					
	Age	Gender	Physical Intervention	Positive Affect	Negative Affect	Parent Responsiveness
Age	1.00	-.06	-.06	.08	-.12	-.27*
Gender	-.06	1.00	-.17	-.15	.03	-.15
Pretest						
Frustration	-.15	-.16	-.01	.02	.65**	.30**

Positive Affect	.19	.09	-.11	.15	-.04	-.16
Negative Affect	-.15	-.01	-.01	-.02	.15	.20
Involvement	.26*	.33**	-.11	.09	-.21*	-.41**
Parent-Child Interaction						
Frustration	-.23*	-.11	.27**	-.11	.14	.22*
Positive Affect	.28**	.03	-.12	.28**	-.06	-.08
Negative Affect	-.26*	-.04	.15	.02	.03	.27**
Involvement	.35**	.10	-.23*	.19	-.20	-.34**
Responsible for Making Decision	.16	.18	-.24*	-.03	-.24*	-.57**
Posttest						
Frustration	-.16	.04	.10	-.19	.16	.17
Positive Affect	.27*	-.02	-.11	.11	-.07	-.07
Negative Affect	-.15	.08	.01	-.19	.24*	.15
Involvement	.31**	.21*	-.28**	.07	-.19	-.32**

*$p < .05$, two tailed. ** $p < .01$, two tailed.

Associations Between Children's Decisions and Parent and Child Behaviors

A second set of correlations were conducted to examine associations between children's decisions and parent and child behaviors *within* each trial (Table 9). For children's behaviors, during the pretest, children who displayed more negative affect were less likely to be involved and to make decisions to delay gratification. During the parent-child interaction trial there was a negative correlation between sharing and gender, with boys more likely to share. For parents' behaviors, children whose parents were more responsive and showed more positive affect were more likely to share. There was also a negative correlation between *responsible for making decision* and sharing, indicating that parents were mostly responsible for making sharing decisions. Results for the posttest show that there was a positive correlation between age and delaying and a negative correlation between gender and delaying. These results suggest that older children and boys were more likely to delay gratification.

Table 9

Correlations Between Child and Parent Behaviors Within Trials

	Pretest		**Parent-Child Interaction**		**Posttest**	
	Share	Delay	Share	Delay	Share	Delay
			Child			
Age	.16	.01	.10	.16	.05	.23*
Gender	-.02	-.09	-.19†	-.12	-.12	-.22*
Involvement	.14	-.20†	.07	.04	.09	.14
Frustration	- .09	.07	.01	-.07	-.02	-.16
Positive Affect	.02	.03	-.02	.02	-.11	-.05
Negative Affect	- .27*	-.19†	-.08	-.07	-.09	-.06
			Parent			
Responsiveness			.40**	.16	.05	-.12
Physical Interventions			.03	.05	-.04	-.05
Positive Affect			.26*	.17	-.06	-.02
Negative Affect			.11	-.01	.13	.10

Responsible for Decisions	-.33**	-.16	.00	-.01

† p < .10; * p < .05, ** p < .01

Parent - Child Behaviors and Decisions

Sharing

To examine the degree to which parent and child behaviors predicted decision making during the parent-child interaction and the child posttest, after controlling for children's pretest decisions, we ran hierarchical regressions. Our first hierarchical regression looked at how children's sharing total during the parent-child interaction was related to parent behaviors. In step 1 children's gender was entered because there was a negative correlation between interaction sharing and gender (as shown in Table 9). Children's pretest sharing was entered in step 2 to control for sharing total during the pretest. In step 3 we included all of the parent's behaviors (*responsiveness, physical interventions, positive affect, and negative affect)*. Step 1 results indicated that there was no significance in R total for children's gender ($R^2 = .028, p < .115$). Step 2 results suggest that there was a significant change in R squared for pretest sharing (total $R^2 = .101, \Delta R^2 = .073, F\ change\ (1,86) = 7.004, p < .05$). Step 3, examining parent behavior predictors, showed a significant change in R squared (total $R^2 = .263, \Delta R^2 = .162, F\ change\ (4,82) = 4.492, p < .05$). This finding indicates that parent behaviors predicted sharing during the parent-child interaction after controlling for children's gender and pretest sharing. Examination of the coefficients indicated that children's sharing during the parent-child interaction was significantly associated with parents responsiveness ($\beta = .642, \mathrm{t}(88) = 3.446, \mathrm{p} < .05$) but not physical intervention ($\beta = -.023, t(88) = -.092, p = .927$), positive affect ($\beta = .222, t(88) = 1.355, p = .179$), or negative affect ($\beta = -.331, t(88) = -.458, p = .648$).

Our next hierarchical regression looked at how children's decisions to share during the parent-child interaction were related to their behavior during the parent-child interaction. In step 1 children's gender was entered, since there was a negative correlation during the parent-child interaction sharing total and child's gender (as shown in Table 9). Children's pretest sharing was entered in step 2 to control for sharing total during the pretest. In step 3 we included all of the child's parent-child interaction behaviors (*involvement, frustration, responsible for making decision, positive affect, and negative affect*). Results indicated that for step 1 children's gender was not significant ($R^2 = .028, p < .115$). For step 2 pretest sharing resulted in a significant change in R squared (total $R^2 = .101, \Delta R^2 = .073, F\ change\ (1{,}86) = 7.004, p < .05$). Step 3, with child behaviors as predictors, approached a significant R squared change (total $R^2 = .263, \Delta R^2 = .162, F\ change\ (4{,}82) = 4.492, p = .056$). This result indicates that after controlling for child gender and pretest sharing, there was a trend toward children's behaviors predicting sharing during the parent-child interaction. Examination of the coefficients indicated that's children's sharing during the parent-child interaction was significantly associated with parents holding the majority of the responsibility for making decisions ($\beta =. -.657, \mathrm{t}(88) = -3.206, \mathrm{p} < .05$), but not for frustration ($\beta = .169, t(88) = .497, p = .620$), involvement ($\beta = .246, t(88) = 8.36, p = .406$), positive affect($\beta = -.031, t(88) = -.163, p = .871$), or negative affect ($\beta = -.382, t(88) = -.873, p = .385$).

In the next set of hierarchical regression analyses we examined children's posttest decisions in relation to parent and child behaviors during the interaction to determine whether parent-child collaborative decision-making predicted children's independent decisions in the posttest after controlling for demographic variables (when applicable) and pretest and parent-child interaction decisions. The first hierarchical regression examined the prediction of children's posttest sharing by parent behaviors. Note that posttest sharing was not related to child age or gender, and those variables were therefore not controlled in these analyses. In step 1 pretest and parent-child interaction sharing were entered as control variables. Step 2 included all of the parent's behaviors (*responsiveness, physical interventions, positive affect, and negative affect*). Results indicated that step 1 resulted in a significant R total, (total $R^2 = .199, p < .05$). However, step 2 did not result in a significant change in R squared, ($R^2 = .234,\ \Delta R^2 = .035, F\ change\ (4{,}81) = .927, p = .453$) indicating that after controlling for pretest and parent-child interaction sharing, parent behaviors did not significantly predict children's posttest sharing.

Next, we ran a hierarchical regression to evaluate the relationship between posttest sharing total and child's parent-child interaction behaviors. In step 1 pretest share total and parent-child interaction share total was entered. Step 2 included all of the child's parent-child interaction behaviors (*involvement, frustration, responsible for making decision, positive affect, and negative affect).* Step 1 results indicated that there was a significant R total for children's pretest share total and parent-child interaction share total (total $R^2 = .199, p < .05$). Step 2 results indicated no significant change in R squared for children's pretest share total, parent-child interaction share total, and child behaviors ($R^2 = .228, \Delta R^2 = .029, F\ change\ (5{,}80) = .594, p = .704$). Results suggested that after controlling for pretest and parent-child interaction sharing, child's parent-child interaction behaviors did not predict children's posttest sharing.

Our next hierarchical regression evaluated the relationship between children's posttest sharing total and child posttest behaviors. In step 1 pretest share total and parent-child interaction share total was entered. Step 2 included all of the child's posttest behaviors (*involvement, frustration, responsible for making decision, positive affect, and negative affect*). Step 1 results indicated that there was a significant R total for children's pretest share total and parent-child interaction share total (total $R^2 =.214, p < .05$). Step 2 results showed there was no significant change in R squared for children's pretest share total, parent-child interaction share total, and child posttest behaviors ($R^2 = .242, \Delta R^2 = .028, F\ change\ (4,82) = .594, p = .704$). Indicated that after controlling for pretest and parent-child interaction sharing totals, child's posttest behaviors did not predict children's posttest sharing.

Delaying

The following hierarchical regression looked at how decisions to delay during the parent-child interaction were related to parent behaviors. Children's pretest delaying was entered in step 1 to control for delaying total during the pretest. In step 2 we included all of the parent's behaviors (*responsiveness, physical interventions, positive affect, and negative affect)*. Step 1 results indicated that there was a significant R total for children's pretest delay total (total $R^2 = .145, p < .05$). Step 2 results showed no significant change in R squared for children's pretest delay total and parent behaviors ($R^2 = .216,\ \Delta R^2 = .072,\ F\ change\ (4,83) = 1.903,\ p = .118$). This finding indicates that parent behaviors did not predict delaying during the parent-child interaction after controlling for children's pretest delaying.

Our next hierarchical regression looked at how decisions to delay during the parent-child interaction were related to children's behavior during the parent-child interaction. Children's pretest delaying was entered in step 1 to control for delaying total during the pretest. In step 2 we included all of the child's parent-child interaction behaviors (*involvement, frustration, responsible for making decision, positive affect, and negative affect*). Step 1 results indicated that there was a significance in R total for children's pretest delay total (total $R^2 = .145, p < .05$). Step 2 results indicate that there was not a significate change in R squared for children's pretest delay total and child's parent-child behaviors ($R^2 = .213, \Delta R^2 = .068, F\ change\ (5,82) = 1.427, p = .223$). This finding suggests that children's parent-child interaction behaviors did not predict delaying during the interaction after controlling for child's pretest delaying.

The next hierarchical regression looked at how children's posttest decisions to delay were related to parent behaviors during the interaction. In step 1 children's gender and age was entered, since there was a correlation between posttest delaying and gender and age (as shown in Table 9). Children's pretest and parent-child interaction delay total was entered in step 2 to control for delaying total during the pretest. In step 3 we included all of the parent's behaviors (*responsiveness, physical interventions, positive affect, and negative affect)*. Step 1 results indicated that there was a significance in R total for children's age and gender (total $R^2 = .083$, $p < .05$). Step 2 results indicated that there was also a significant change in R squared between gender, age, pretest delay total, and parent-child interaction delay total (total $R^2 = .341, \Delta R^2 = .258, F\ change\ (2,83) = 16.266, p < .05$). Step 3 results showed that gender, age, pretest delay total, parent-child interaction delay total, and parent behaviors approached significance (total $R^2 = .412, \Delta R^2 = .070, F\ change\ (4,79) = 2.358, p = .061$). This result indicates that after controlling for child gender, age, pretest and parent-child interaction delaying, there was a trend toward parents' behaviors predicting delaying during the posttest. Examination of the coefficients indicated that's children's delaying during the posttest was significantly associated with parents responsiveness ($\beta = -.518, \mathrm{t}(88) = -2.387, \mathrm{p} < .05$), negative affect approached significant ($\beta = 1.529, t(88) = 1.908, p = .060$), and physical intervention ($\beta = -.113, t(88) = -.426, p = .671$), and positive affect ($\beta = -.164, t(88) = -.011, p = .365$) were not significant.

Our next hierarchical regression looked at how children's posttest decisions to delay were related to children's parent-child interaction behaviors. In step 1 children's gender and age was entered, since there was a correlation between posttest delaying, gender, and age (as shown in Table 9). Children's pretest and parent-child interaction delay total was entered in step 2 to control for delaying total during the pretest and parent-child interaction. In step 3 we included all of the child's parent-child behaviors (*involvement, frustration, responsible for making decision, positive affect, and negative affect)*. Step 1 results indicated that there was a significance in R total for children's age and gender (total $R^2 = .083, p < .05$). Step 2 results showed a significant change in R squared between gender, age, pretest delay total, and parent-child interaction delay total (total $R^2 = .341, \Delta R^2 = .258, F\ change\ (2{,}83) = 16.266, p < .05$). Step 3 results showed that gender, age, pretest delay total, parent-child interaction delay total, and child behaviors were not significant (total $R^2 = .364, \Delta R^2 = .023, F\ change\ (5{,}78) = .570, p = .723$). This suggest that children's parent-child interaction behaviors did not predict delaying during the posttest after controlling for child's age, gender, pretest and parent-child interaction delaying.

The last hierarchical regression looked at how posttest decisions to delay were related to children's posttest behaviors. In step 1 children's gender and age was entered, since there was a correlation between posttest delaying, gender, and age (as shown in Table 9). In step 2 children's pretest and parent-child interaction delay total was entered to control for delaying totals during the pretest and parent-child interaction. In step 3 we included all of the child's posttest behaviors (*involvement, frustration, responsible for making decision, positive affect, and negative affect)*. Step 1 results indicated that there was a significance in R total for children's age and gender (total $R^2 = .095, p < .05$). Step 2 results showed a significant change in R squared between gender, age, pretest delay total, and posttest delay total (total $R^2 = .359, \Delta R^2 = .264, F\ change\ (2{,}84) = 17.282, p < .05$). Step 3 results showed that gender, age, pretest delay total, parent-child interaction delay total, and child posttest behaviors were not significant (total $R^2 = .400, \Delta R^2 = .041, F\ change\ (4{,}80) = 1.376, p = .250$). This suggest that children's posttest behaviors did not predict delaying during the posttest after controlling for child's age, gender, pretest and interaction delaying.

Discussion

Child Behavior and Decision Differences By Age and Gender Across Trials

We first evaluated whether there were age and gender differences in behaviors across trials and whether there was a change in child behaviors while and after they engaged with their parent. Results indicated an age differences in behaviors. Overall, 5-year-olds were more involved, less frustrated, displayed higher levels of positive affect and lower levels of negative affect. These age differences are consistent with the literature on executive function development which suggests that at the age of 4 executive function development is underway and continues to improve from 5 to 8 years old (see Best & Miller, 2010). There were also changes in children's behaviors across all three trials. Involvement steadily declined and frustration increased from the pretest to posttest. These patterns may suggest a fatigue effect among children as the task progressed. The task used in this study required children to make a total of 8 decisions, which may have been too many decisions for this age group to successfully dedicated the necessary cognitive abilities. Future research should consider adapting the task to be more age appropriate and easier to complete.

Our findings also indicated that older children were more likely to consider the future and others while making decisions about stickers throughout all three trials. While younger children's decision to delay decreased, older children's decreased. 3-year old's decisions to delay decreased across trials, suggesting that the possible fatigue effect noted earlier is driven by the youngest children. 4-year-olds average decisions to share and delay increased across trails as well. 5-year-olds demonstrated an increase to share and delay during the parent-child interaction, but a decrease in the posttest. These findings also support our previous claim that at the age of 4, executive functions begin to develop. This also implies that 4-year-olds seem to benefit the most from join decision-making with a parent. Children's decision to share did not significantly change after completing the sticker task with their parent. Although not significant, decisions to delay did increase when interacting with a parent and increased again during the posttest. This may suggest that while children's decisions to share were only influenced while interacting with their parent, children may have learned more about decisions to delay after interacting with their parent that carried over into independent decision-making in the posttest. It may be that a one-time joint-decision-making task may not provide sufficient support to the youngest children's decision-making in a sustained way.

Interaction Between Child and Parent Behaviors

Next, we considered further behavioral interaction between child and parent behaviors, and if these interactions influenced each other. Findings indicated parental responsiveness had a positive association with child frustration and a negative association with child involvement. On the one hand, this may suggest that parents were overly involved in making decisions during the joint task, resulting in children's frustration and lack of involvement. On the other hand, the findings may suggest that parents provided the necessary guidance and support when their child displayed the need for it. That is, perhaps they engaged in more responsiveness because children were less involved and frustrated with the task, thereby supporting the idea of scaffolding or adjusting their interactions and cognitive support based on their child's behaviors (Gauvain et al., 2012; Perez & Gauvain, 2009)(Gauvain et al., 2012; Perez & Gauvain, 2009). In order to better determine which behaviors are most or least useful, future studies may want to consider more specific instructional or scaffolding behaviors from parents when evaluating their associations to child learning. For instance, in Hammond et al. (2012) study parents scaffolding techniques was determined based on consistency, and in Hughes and Ensor (2009) study parents scaffolding was evaluated based on open-ended questions, praise, encouragement, or elaborating. Looking at different perspectives of scaffolding techniques can potential help identify beneficial parent behaviors. It may also be beneficial to examine more closely which parenting behaviors may benefit children of different ages in early childhood. Given that the youngest children seemed to benefit least from parent-child interaction, understanding what supports may be needed at different ages is an area of potential future study.

Parent and Child Interactions Influence Decisions

Recall that there was a significant positive association between parents' responsiveness and decisions to share during the parent-child interaction, even after controlling for pretest decisions and child gender and age. We can then infer that parents' levels of responsiveness had an influence on decisions to share. However, in the current study parent-child decision-making patterns did not significantly carry over into the child's independent decisions in the posttest. This could be due to two possible reasons. First, as suggested by previous research and the findings of the current study, young children may still rely heavily on parental guidance and support for complex cognitive tasks, including these types of decisions. While they may improve decision-making in the presence of a parent, for very young children that experience may not be sustained when the child is working independently (e.g., Gauvain & Perez, 2005; Hammond et al., 2012; Merz et al., 2017). Second, the amount of time given during the parent-child interaction may have not been enough to see an immediate effect in the posttest. Unlike our study, previous studies have found a positive change in children's EF after a longer period of time (Merz et al., 2017; Sorariutta & Silvén, 2018). Future studies may also want to investigate how the continuity of cognitive support over a longer period of time might contribute to improving children's independent performance. For example, a study conducted by Merz et al. (2017) demonstrated that children age 3 to 6 showed increased delay inhibition over a 6-month period. Note that delay inhibition is the ability y to control an impulse when a reward is present, which is similar to children delaying gratification is our current study. Specifically, the interaction between parent-child dyads was evaluated on parent responsiveness during a free play session at two separate occasions (6 months apart). After the 6-month period, children whose parents provided higher levels of responsiveness had a positive change in delay inhibition. It is likely that the observed responsiveness at the first occasion was representative of the type of parental support that was likely to continue throughout the 6-month period. Thus, an avenue for future study is to examine the types of scaffolding and guided support that take place in more everyday contexts and interactions between parents and children over a period of time in early childhood to better understand the types of support that contribute to learning about complex decisions that involve social and future-oriented considerations.

In addition to parent responsiveness, we also examined parent behaviors that reflected control. Specifically, we predicted that parents who provided higher levels of directing their child's activities by physically intervening (holding the child's hands to keep them from reaching for the sticker) in the child's behavior would be negatively associated or have no association with their child's overall decision making. Results indicated no association between children's decision making and parents physically intervening during the sticker task. Physically intervening likely reflects parents' attempts to manage child behavior rather than cognitive support or scaffolding that would contribute to children's learning from the experience. Future research could examine whether continuity of behavior regulation across early childhood from the parent during joint decision-making contributes negatively to children's development of complex decision-making.

Another feature of the parent-child interaction that we examined was whether children's decision to share or delay was related to the extent to which the child versus the parent was responsible for making decisions while they worked together. Results demonstrated that, overall, parents were more responsible than children were for making sharing decisions. And, in turn, children's sharing returned to pretest levels during the posttest and decisions to delay only increased slightly in the posttest. Taken together, these findings suggest that parents may have directed decision-making rather than helped to guide and support children's decision making. And, in doing so, children were not prepared to continue to make decisions that considered others and the future when working independently. Previous research has suggested the importance for cognitive growth of actively involving children in the cognitive task (Bornstein & Lamb, 2015; Crain, 2000; Rogoff, 1990). In the current study parents and children were simply asked to work together. It may be that if parents were more explicitly instructed to help their children prepare for independent performance of decisions in the posttest, their approach to the joint decision-making task would have reflected greater guided participation and involvement of the child (Perez & Gauvain, 2009). Future research could examine comparisons between dyads in which parents are or are not instructed to prepare children for the posttest to determine whether a clear goal for the interaction results in greater child involvement and, in turn, improved decisions by children in the posttest. Future research would also benefit from a longitudinal examination of these patterns to determine whether differences in parental approaches to interaction and instruction with children on these types of decision-making task contribute to long-term differences in children's capacity to make socially and future oriented decisions.

The findings in this study have supported previous findings and have suggested questions for future study. Like other studies we found that by the age of 4 children are capable of engaging in EF, can consider social and future-oriented decisions and that scaffolding plays a role in the development of children's EF skills. Our findings have also proposed that overall parents may have a direct influence on their children's decision making to either share or delay, but only when they are present and providing the necessary responsiveness. Future studies could evaluate what specific scaffolding techniques are necessary to provide children with long term positive effects. It may be particularly useful to study parent-child interaction patterns in more everyday contexts in order to tap into the continuity of interaction that may be important for the development of complex decision-making. Further investigation of the parent-child interaction can help clarify how parents play in a role in the development of children's decision-making.

References

Bari, A., & Robbins, T. W. (2013). Inhibition and impulsivity: Behavioral and neural basis of response control. *Progress in Neurobiology*, *108*, 44–79. https://doi.org/10.1016/j.pneurobio.2013.06.005

Bjourklund, D. F., & Myers, A. J. (2015). The Development of Cognitive Abilites. In *Developmental Science an Advanced Textbook* (7th ed., pp. 391–441). Psychology Press.

Bornstein, M. H., & Lamb, M. E. (2015). *Developmental Science an Advanced Textbook* (7th ed.). Psychology Press. http://eds.b.ebscohost.com.dax.lib.unf.edu/eds/ebookviewer/ebook/bmxlYmtfXzMzOTk0NV9fQU41?sid=56671bce-7fd6-4994-b10a-ea5fdf1e510c@pdc-v-sessmgr04&vid=1&hid=http://eds.b.ebscohost.com.dax.lib.unf.edu/&format=EB

Brocas, I., & Carrillo, J. D. (2020). Introduction to special issue "Understanding Cognition and Decision Making by Children." Studying decision-making in children: Challenges and opportunities. *Journal of Economic Behavior and Organization*, *xxxx*, 1–7. https://doi.org/10.1016/j.jebo.2020.01.020

Brownell, C. A., Svetlova, M., & Nichols, S. (2009). To share or not to share: When do toddlers respond to another's needs? *Infancy*, *14*(1), 117–130.

https://doi.org/10.1080/15250000802569868

Çakıroğlu, A. (2018). The language acquisition approaches and the development of literacy skills in children. *International Electronic Journal of Elementary Education*, *11*(2), 201–206. https://doi.org/10.26822/iejee.2019248600

Conway, A., & Stifter, C. A. (2012). Longitudinal Antecedents of Executive Function in Preschoolers. *Child Development*, *83*(3), 1022–1036. https://doi.org/10.1111/j.1467-8624.2012.01756.x

Crain, W. (2000). Vygotsky's Social-Historical Theroy of Cognitive Development. In *Theories of Development: Concepts and Applications* (4th ed., pp. 224–252). Prentice Hall.

Ellis, N. C. (2015). Implicit AND Explicit Language Learning: Their dynamic interface and complexity. In *Implicit and explicit learning of languages* (pp. 3–23). https://doi.org/10.1075/sibil.48.001for

Garon, N., Longard, J., Bryson, S. E., & Moore, C. (2012). Making decisions about now and later: Development of future-oriented self-control. *Cognitive Development*, *27*(3), 314–322. https://doi.org/10.1016/j.cogdev.2012.05.003

Garon, N., & Moore, C. (2004). Complex decision-making in early childhood. *Brain and Cognition*, *55*(1), 158–170. https://doi.org/10.1016/S0278-2626(03)00272-0

Garon, N., & Moore, C. (2007). Awareness and symbol use improves future-oriented decision making in preschoolers. *Developmental Neuropsychology*, *31*(1), 39–59. https://doi.org/10.1207/s15326942dn3101_3

Gauvain, M., & Perez, S. (2015). Cognitive Development and Culture. In *Handbook of Child*

Psychology and Developmental Science (pp. 854–896). https://doi.org/10.1002/9781118963418.childpsy220

Gauvain, M., & Perez, S. M. (2005a). Not all hurried children are the same: Children's participation in deciding on and planning their after-school activities. In *The Development of Judgment and Decision-Making in Children and Adolescents.* (pp. 213–240). Mahwah, NJ: Erlbaum.

Gauvain, M., & Perez, S. M. (2005b). Parent-child participation in planning children's activities outside of school in European American and Latino families. *Child Development*, *76*(2), 371–383. https://doi.org/10.1111/j.1467-8624.2005.00851_a.x

Gauvain, M., Perez, S. M., & Beebe, H. (2012). Authoritative parenting and parental support for children's cognitive development. *Authoritative Parenting: Synthesizing Nurturance and Discipline for Optimal Child Development.*, 211–233. https://doi.org/10.1037/13948-010

Gauvain, M., & Rogoff, B. (1989). Collaborative Problem Solving and Children's Planning Skills. *Developmental Psychology*, *25*(1), 139–151. https://doi.org/10.1037/0012-1649.25.1.139

Hammond, S. I., Müller, U., Carpendale, J. I. M., Bibok, M. B., & Liebermann-Finestone, D. P. (2012). The effects of parental scaffolding on preschoolers' executive function. *Developmental Psychology*, *48*(1), 271–281. https://doi.org/10.1037/a0025519

Hollingshead, A. B. (2011). Four factor index of social status. *Yale Journal of Sociology*, *8*, 21–52. http://elsinore.cis.yale.edu/sociology/yjs/yjs_fall_2011.pdf#page=21

Hughes, C., & Devine, R. T. (2019). For Better or for Worse? Positive and Negative Parental Influences on Young Children's Executive Function. *Child Development*, *90*(2), 593–609.

https://doi.org/10.1111/cdev.12915

Jensen, L. A., Hein, S., Reich, J., & Grigorenko, E. L. (2014). Cultural Manifestation of Intelligence in Formal and Informal Learning Environments During Childhood. In *The Oxford Handbook of Human Development and Culture: An Interdisciplinary Perspective* (pp. 214–229). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199948550.013.14

Kar, B. R., Vijay, N., & Mishra, S. (2013). Development of cognitive and affective control networks and decision making. In *Progress in Brain Research* (1st ed., Vol. 202, pp. 347–368). Elsevier B.V. https://doi.org/10.1016/B978-0-444-62604-2.00018-6

Mathews, R. C., Buss, R. R., Stanley, W. B., Blanchard-Fields, F., Cho, J. R., & Druhan, B. (1989). Role of Implicit and Explicit Processes in Learning From Examples: A Synergistic Effect. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *15*(6), 1083–1100. https://doi.org/10.1037/0278-7393.15.6.1083

Merz, E. C., Landry, S. H., Montroy, J. J., & Williams, J. M. (2017). Bidirectional Associations Between Parental Responsiveness and Executive Function During Early Childhood. *Social Development*, *26*(3), 591–609. https://doi.org/10.1111/sode.12204

Miller, P. H. (2002). Vygotsky and the Sociocultural Approach. In *Theories of developmental psychology* (pp. 367–419).

Moffett, L., Flannagan, C., & Shah, P. (2020). The influence of environmental reliability in the marshmallow task: An extension study. *Journal of Experimental Child Psychology*, *194*, 104821. https://doi.org/10.1016/j.jecp.2020.104821

Moll, L. C. (1990). Introduction. In *Vygotsky and Education: Instructional Implications and*

Applications of Sociohistorical Psychology (pp. 1–28). Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781139173674.002

Moore, C., Barresi, J., & Thompson, C. (1998). The cognitive basis of future-oriented prosocial behavior. *Social Development*, *7*(2), 198–218. https://doi.org/10.1111/1467-9507.00062

Perez, S. M. (2004). Relations among child emotionality, mother -child planning, and children's academic adjustment and achievement in the first grade [University of California Riverside]. In *ProQuest Dissertations and Theses*. https://search.proquest.com/docview/305199366?accountid=14509%0Ahttp://ucelinks.cdlib.org:8888/sfx_local?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:dissertation&genre=dissertations+%26+theses&sid=ProQ:Dissertations+%26+Theses+%40+University+of+C

Perez, S. M., & Gauvain, M. (2009). Mother-child planning, child emotional functioning, and children's transition to first grade. *Child Development*, *80*(3), 776–791. https://doi.org/10.1111/j.1467-8624.2009.01297.x

Radziszewska, B., & Rogoff, B. (1991). Children's Guided Participation in Planning Imaginary Errands With Skilled Adult or Peer Partners. *Developmental Psychology*, *27*(3), 381–389. https://doi.org/10.1037/0012-1649.27.3.381

Rogoff, B. (1990). *Apprenticeship in Thinking Cognitive Developemnt in Social Context*. Oxford University Press.

Sorariutta, A., & Silvén, M. (2018). Quality of both parents' cognitive guidance and quantity of early childhood education: Influences on pre-mathematical development. *British Journal of Educational Psychology*, *88*(2), 192–215. https://doi.org/10.1111/bjep.12217

Thompson, C., Barresi, J., & Moore, C. (1997). The development of future-oriented prudence and altruism in preschoolers. *Early Childhood Research Quarterly*, *12*(2), 199–212. https://doi.org/10.1016/s0885-2014(97)90013-7

Tian, X. (2018). Generating Pastoral Skills through Work and Play in the Daily Life of Maasai Children in Kenya. *Journal of Ethnobiology*, *38*(2), 170–186. https://doi.org/10.2993/0278-0771-38.2.170

van 't Wout, F., O'Donnell, M., & Jarrold, C. (2019). An investigation of children's working memory capacity for task rules. *Cognitive Development*, *51*(October 2018), 14–31. https://doi.org/10.1016/j.cogdev.2019.05.007

Veraksa, A., Bukhalenkova, D., Kartushina, N., & Oshchepkova, E. (2020). The relationship between executive functions and language production in 5-6-year-old children: Insights from working memory and storytelling. *Behavioral Sciences*, *10*(2). https://doi.org/10.3390/bs10020052

Vygotsky, L. S. (1978). Mind in Society: The Development of Higher Psychological Processes. In *President and Fellows of Harvard College*. https://doi.org/10.1111/j.1651-2227.1941.tb05818.x

Wong, K., Hicks, L. M., Seuntjens, T. G., Trentacosta, C. J., Hendriksen, T. H. G., Zeelenberg, M., & van den Heuvel, M. I. (2019). The role of mindful parenting in individual and social decision-making in children. *Frontiers in Psychology*, *10*(MAR), 1–10. https://doi.org/10.3389/fpsyg.2019.00550

Wood, D., & Middleton, D. (1975). A STUDY OF ASSISTED PROBLEM-SOLVING. *British Journal of Psychology*, *66*(2), 181–191. https://doi.org/10.1111/j.2044-8295.1975.tb01454.x

Zelazo, P. D., Frye, D., & Rapus, T. (1996). An age-related dissociation between knowing rules and using them. *Cognitive Development*, *11*(1), 37–63. https://doi.org/https://doi.org/10.1016/S0885-2014(96)90027-1