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Development and Persuasion Processing: An Investigation of Children's Advertising Susceptibility and Understanding

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Abstract
Over the past 40 years, research on children's understanding of commercial messages and how they respond to these messages has tried to explain why younger children are less likely to understand these messages and are more likely to respond favorably to them with varying success (Kunkel et al., 2004; Ward, Wackman, & Wartella, 1977), however this line of research has been criticized for not adequately engaging developmental research or theorizing to explain why/how children responde to persuasive messages (Moses & Baldwin, 2005; Rozendaal, Lapierre, Buijzen, van Reijmersdal, 2011). The current study attempts to change this by empirically testing whether children's developing theory of mind, executive function, and emotion regulation helps to bolster their reaction to advertisements and their understanding of commercial messages.

With a sample of 79 children between the ages of 6 to 9 and their parents, this study sought to determine if these developmental mechanisms were linked to processing of advertisements and understanding of commercial intent. Moreover, the current study tested whether these aspects of cognitive and affective development explain children's understanding of and reaction to advertisements above and beyond age and cognitive ability as earlier researchers have proposed (e.g., Chernin, 2007; Kunkel et al., 2004).

The results suggest that children and media researchers would be well advised to consider how these more recent advancements in developmental research influence persuasion understanding and responses to commercial messages. In particular, this study found that children with less developed theory of mind are less likely to understand why advertisements are shown on television, that children who struggled to control their reactions to emotionally exciting stimuli asked for more consumer products and fought with their parents more about these requests, and children with less developed executive function were more likely to ask their parents for more consumer goods. However, with this last set of findings, they should be interpreted with caution due to the large number of hypothesis testing.

These results also offer important insights into how developmental mechanisms influence consumer behavior along with new entry points for the study of how individuals develop as consumers of persuasive messages. Moreover, while the results of this study are not uniformly conclusive, there are interesting implications for how children are sold to and what constitutes fair practice based on these developmental differences.

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AN INVESTIGATION OF CHILDREN'S ADVERTISING SUSCEPTIBILITY AND UNDERSTANDING

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DEVELOPMENT AND PERSUASION PROCESSING:

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Dedication

For the people who set me on my way, my parents: Earlene and Bernard Lapierre. For the one that has kept me there, my wife: Melanie. And the ones that keep me going, my daughters: Amelia and Emaline.

Acknowledgements

As a child, when I thought about what I wanted to do with my life, I decided that any profession that required me to write a lot would definitely not be a suitable profession for me to go into. The idea of sitting in front of a typewriter, word processor, or computer and typing pages upon pages of material was just about the worst thing I could imagine. As such, it is strange that I chose a career field where one's entry into the profession requires hundreds of written pages. Nevertheless, here I am. I am here because I love inquiry more than I hate the drudgery of writing and this would never have happened without the tremendous support from a number of people.

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and for never letting me think that 'just OK' was good enough. When other parents would have welcomed a B- on a report card, you told me that I could always do better and that is a lesson that has followed me throughout my educational career. I love you both so very much.

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ABSTRACT

DEVELOPMENT AND PERSUASION PROCESSING: AN INVESTIGATION OF CHILDREN'S ADVERTISING SUSCEPTIBILITY AND UNDERSTANDING

Matthew A. Lapierre

Joseph N. Cappella

Over the past 40 years, research on children's understanding of commercial messages and how they respond to these messages has tried to explain why younger children are less likely to understand these messages and are more likely to respond favorably to them with varying success (Kunkel et al., 2004; Ward, Wackman, & Wartella, 1977), however this line of research has been criticized for not adequately engaging developmental research or theorizing to explain why/how children responde to persuasive messages (Moses & Baldwin, 2005; Rozendaal, Lapierre, Buijzen, van Reijmersdal, 2011). The current study attempts to change this by empirically testing whether children's developing theory of mind, executive function, and emotion regulation helps to bolster their reaction to advertisements and their understanding of commercial messages.

With a sample of 79 children between the ages of 6 to 9 and their parents, this study sought to determine if these developmental mechanisms were linked to processing of advertisements and understanding of commercial intent. Moreover, the current study

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The results suggest that children and media researchers would be well advised to consider how these more recent advancements in developmental research influence persuasion understanding and responses to commercial messages. In particular, this study found that children with less developed theory of mind are less likely to understand why advertisements are shown on television, that children who struggled to control their reactions to emotionally exciting stimuli asked for more consumer products and fought with their parents more about these requests, and children with less developed executive function were more likely to ask their parents for more consumer goods. However, with this last set of findings, they should be interpreted with caution due to the large number of hypothesis testing.

These results also offer important insights into how developmental mechanisms influence consumer behavior along with new entry points for the study of how individuals develop as consumers of persuasive messages. Moreover, while the results of this study are not uniformly conclusive, there are interesting implications for how children are sold to and what constitutes fair practice based on these developmental differences.

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Background

Advertising & Children

Children in the United States are exposed to a tremendous number of advertising messages. The average American child sees more advertisements than a child from any other major Western country (Mallalieu, Palan & Laczniak, 2005), as American children see one hour of advertisements for every five hours of television viewed (Gantz, Schwartz, Angelini & Rideout, 2007). Moreover, there is little official oversight regarding how the advertising industry operates in the United States. Whereas many of our Western counterparts have instituted governmental policies to regulate how advertisers reach children via traditional screen media, marketers in the United States are primarily self-regulated and are only bound by a few statutes that limit the amount of advertised content directed to children (Mallalieu, Palan & Laczniak, 2005; Ramsay, 2006)[1].

With this degree of unfettered access to children, it should come as no surprise that companies spend large sums of money to persuade young people to purchase their products. These companies spend billions of dollars each year in order to ensure that their messages make it onto the television screens, magazine pages, video games and other media that children are most likely to use (Marr, 2008). Yet, for all these companies spend; they get significantly more in return. According to most recent estimates, American children, either through direct purchasing or through influencing the purchases their parents make, are responsible for over $350 billion in total consumer spending in

[1] The Children's Television Act (CTA) stipulates (1990) that broadcasters must limit the amount of commercial time on weekends to 10.5 minutes per hour and 12 minutes per hour on weekdays (Ramsay, 2006).

the average year (Schor & Ford, 2007). Furthermore, not only do children represent a great market for the here and now, but they are an investment in the future as they have a lifetime of purchasing decisions ahead of them. As such, it benefits advertisers to build brand loyalties while these consumers are young and have yet to establish consistent brand preferences (McNeal, 1998).

For child-advocates, there is a question about whether all these marketing messages directed at young audiences represent a fair practice (Linn, 2004). As evidence for their point, these advocates point to the work of scholars in the children and media field who have arrived at an apparent consensus on the subject of child-focused advertising. This consensus is- that until children reach a certain age they are fundamentally incapable of understanding what advertisers are trying to accomplish when they make their appeals and, consequently, should not be targets of commercial messages (Kunkel et. al., 2004, Valkenburg & Cantor, 2001). For close to four decades, researchers who study children and advertising have held the view that it is typically not until eight years of age that children are fully capable of competently engaging with persuasive messages (Kunkel, 2010; Kunkel et. al., 2004). However, when looking at the collected evidence that supports this view, there are some noticeable problems.

First, linking certain cognitive defenses (e.g., knowledge of persuasive intent, knowledge of selling intent) to increased scrutiny of advertising appeals is problematic (Rozendaal, Lapierre, Buijzen & van Reimersdal, 2011). For example, one hypothesized way to lessen the effect of advertising appeals on children is to teach these children about the purpose of advertising, thereby increasing their awareness of the persuasive tactics used in advertising appeals (Eagle, 2007). Yet, as reviews of the efficacy of advertising

literacy interventions have shown, there is little evidence that presenting children with advertising based knowledge is sufficient to help children adequately weigh the costs and benefits associated with a persuasive message (e.g., Buijzen, 2007). In one sense, these interventions are successful as children do learn that advertisements are designed to persuade, yet even armed with this knowledge, these children are not better prepared to resist advertising messages (Chernin, 2007; Livingstone & Helsper, 2006)[2].

The second problem, which is directly related to the first problem, is that there is not a clear theoretical mechanism within the realm of cognitive development to explain why specific types of advertising knowledge should reduce advertising susceptibility. When typically referencing a theory, most of the scholars point to the pioneering work of developmental psychologist Jean Piaget to explain how children react to advertisements and why knowledge of persuasive and selling intent should reduce advertising susceptibility. However, as Moses and Baldwin (2005) note, there is no substantive reason to connect the work of Piaget with this particular type of cognitive processing (or for most matters relating to cognitive development). Instead, they recommend looking towards recent advancements in cognitive developmental research to help child and media scholars understand how children process advertisements (e.g., Rozendaal, Lapierre, Buijzen & van Reimersdal, 2011).

Children and Advertising Research: A Call for a Change in Paradigms

[2] I do not mean to imply that literacy interventions do not work for other types of media messages. As I highlight later in this dissertation, the issues relating to why advertising interventions are not as successful for children is because of the unique nature of advertising messages coupled with children's nascent cognitive control.

The following study takes a step in this direction by taking this out of the realm of theoretical speculation and testing these relationships empirically. Using a sample of 79 children between the ages of 6 and 8 along with their parents, this study tested whether certain well known elements of cognitive and affective development were linked to children's consumer development. Specifically, the study explored whether children's theory of mind development predicts their understanding of persuasive messages, whether children's executive function capabilities are linked to advertising susceptibility, and if children's ability to regulate emotions is associated with purchase requests and/or conflict with parents (e.g. over product purchses).

However, to understand the logic behind these changes it is necessary to explain the current conceptualization of children's processing of advertisements and where the current explanatory mechanisms break down. This model is presented as a way to correct many of the gaps in current thinking and research and advances the field of children and advertising research in two key ways by borrowing research findings in cognitive research and introducing key components of emotional development that potentially mediate the cognitive mechanism. First, it offers a theoretical mechanism to explain why knowledge of persuasive and selling intent does not influence advertising susceptibility. Simultaneously, it proposes a new mechanism to explain why young children are more vulnerable to advertiser messages. Specifically, I test whether children can competently and consistently process commercial messages, and whether they must develop certain regulatory cognitive abilities.

Knowledge of Persuasive Intent, Knowledge of Selling Intent and Persuasion Processing

A great deal of the focus in children and advertising research over the last 40 years has been on determining when children have the requisite cognitive defenses to protect them from advertising messages (Rozendaal, Lapierre, Buijzen & van Reimersdal, 2011). Perhaps first among these defenses, in terms of research and theoretical attention paid, is the child's knowledge of persuasive intent (i.e., when children begin to understand that advertisements are designed to persuade their audience) and selling intent (i.e., when children begin to understand that advertisements are designed to sell products to the audience). Starting with Scott Ward in the early 70s, researchers have been looking for the 'magic' age where children are able to understand that marketers are not simply providing them with unbiased information (Chernin, 2007). As Kunkel and his colleagues (2004) note in their review of the research for the American Psychological Association, the consensus view on when this transpires for children is around eight years of age.

However, the collected research on knowledge of persuasive and selling intent and their influence on children's advertising vulnerability shows that the link is limited at best, as there are issues both with the lack of solid evidence and with the potential third variables that might explain the relationship. This lack of evidence linking these two constructs is present in both survey research and experimental research, where children are taught about the true nature of advertising messages (Institute of Medicine, 2006; Mallinckrodt & Mizerski, 2007; Ross, Campbell, Wright, Huston, Rice, & Turk, 1984). In regards to the results of the survey research, the findings are frequently contradictory. For example, Rossiter and Robertson (1974) found that knowledge of persuasive intent predicted reduced advertising susceptibility but only for the oldest children in the sample

and only at one of the two measurement points. On the other hand, with samples that were roughly equivalent in age, Ward, Wackman and Wartella (1977), found that this relationship only existed with younger children in their study.

The experimental results offer even less support for this hypothesis. In these studies, children in the treatment condition receive an educational intervention that will teach them about the persuasive nature of television advertisements. Afterwards, these children are tested on how much they would like to purchase the advertised product. Compared to controls, the children are no more or less likely to find the advertisements persuasive, even when members of the treatment group have demonstrated significant gains in knowledge of persuasive intent due to the intervention (see Livingstone & Helsper, 2006).

What explains this lack of findings? The first issue is a methodological one. As Kunkel (2010) notes, there has been a consistent problem with how knowledge of persuasive intent and selling intent have been measured. On the one hand, researchers have not applied a consistent measure of advertiser intent across studies. Some researchers have used pictorial cues to assess knowledge (Gunter, Oates and Blades, 2005) while others have relied upon complex open-ended statements (e.g., Ward, Wackman & Wartella, 1977). Moreover, there has been a great deal of confusion over what is actually being measured as some researchers have made knowledge of selling intent equivalent to knowledge of persuasive intent (Kunkel, 2010) as well as the seemingly uniform manner that scholars have conceptualized persuasive appeals (Rozendaal, Buijzen, & Valkenburg, 2011). As will be discussed later on, understanding

persuasion is more complex than understanding selling, as persuasion frequently entails the use of bias while selling does not necessarily require the use of bias.

The second problem is that this theorizing does not correspond to what we know about adults. If we assume that knowledge of persuasive and selling intent is what shields individuals from 'falling for' marketing appeals and that this is a skill which most adults have, then what explains the fact that fully mature and competent adults are frequently drawn in by advertising appeals? In most cases, we can perhaps assume that the adult is making a reasoned assessment about the persuasive appeal, but what grown adult has not been in the position where a certain advertisement comes on screen and he or she feels compelled to buy the product? Knowing that the message presents a biased representation of reality does not always lead to skeptical processing of the message. For example, adults are often persuaded when the message meets an immediate need, helps one feel like they are part of the 'crowd' and, particularly, when cognitive capacity is limited (Campbell & Kirmani, 2000).

The third issue associated with focusing on cognitive defenses like knowledge of persuasive intent and selling intent, is that this viewpoint ignores the primary ways that advertisers actually try to reach young consumers. The assumption is that once children know about the persuasive/selling intent and can identify the persuasive act, they will then be able to parse the persuasive part of the message (Rozendaal, Buijzen & Valkenburg, 2009). However, this viewpoint additionally assumes that there are actually clear persuasive messages to parse in children's advertisements or that these messages utilize consistent appeals (Rozendaal, Buijzen, & Valkenburg, 2011).

Empirical examinations of the structure of televised persuasive appeals made to children, tell a different story about how marketers try to reach children (Buijzen & Valkenburg, 2002; Kelly et al, 2010; Page & Brewster, 2007, 2009; Warren et al, 2008). Instead of providing a clearly stated argument for why the child should purchase the product or carefully articulating the benefits associated with use of the product, the evidence collected from these content analyses reveal that many of the advertisements produced for children avoid rational or 'classic' persuasion. Rather, the actual persuasion that occurs in these advertising messages is far more subtle, with the majority of commercial messages focused on such things like the camaraderie involved in using the product or the magical transformations that take place when children consume or use a product (Buijzen & Valkenburg, 2002; Lapierre, 2008; Page & Brewster, 2009).

While the rational aspects of marketing messages are not as apparent in children's advertisements, the messages do rely heavily upon emotionally evocative cues to excite and entice young consumers. As noted above, marketers fill their commercials with images of children smiling, dancing, playing and generally rejoicing in whatever situation they are involved in (Buijzen & Valkenburg, 2002; Page & Brewster, 2009; Warren et al, 2008). Children's advertisements also frequently feature popular media characters or trade characters that children feel a great deal of affinity and loyalty towards (Connor, 2006; Kelly et al., 2010; Lapierre, Vaala & Linebarger, 2011; Roberto et al., 2010). These advertisements also use tactics to imbue their messages with perceptually pleasing audiovisual features and feature loud exciting music, rapid camera cuts, bright colors and vivid imagery (Warren et al, 2008).

Rather than trying to reach children through rational or direct persuasion techniques, the empirical evidence suggests that advertisers are actually working to create strong and lasting emotional bonds with children. For example, a content analysis of children's advertisements in the Netherlands by Buijzen and Valkenburg (2002) found that 58% of advertisements used play appeals, 39% used action/adventure appeals and 30% used 'fun' appeals (the categories were not mutually exclusive). On the other hand, none of the 131 advertisements used convenience or product based appeals. A similar study by Kelly et al (2010) looking at a wide array of international advertisements (including a sample of American commercials), further found that these persuasive messages do not use rational appeals. Instead, marketers are eschewing 'classic' persuasion and are simply trying to get children to feel good about their product by associating that product with powerful emotional appeals and child friendly characters. With this in mind, it should be clear why focusing on children's cognitive defenses is potentially so problematic and ultimately unsuccessful. Children are supposed to see advertisements as messages designed to change their minds through the presentation of rational argumentation and information when, in practice, they operate at a much more nuanced persuasive level.

Yet considering how affect laden these messages are and how often they tend to rely on appeals to emotion, it is interesting to note that there has been very little empirical work that focuses on children, emotions and advertising (Chernin, personal communication). In fact, a thorough search of the children and advertising literature yields no studies that have explored how a child's emotional or affective competence influences his or her processing and response to advertising messages.

The final reason derives from an incomplete analysis of how advertising fits within a child's broader developmental trajectory and which theoretical framework can more inclusively explain the myriad of findings. Many media effects in children are believed to occur through some type of developmental activity. Nevertheless, there is a deep disconnect between recent developmental research and media effects research. Consequently, much of the recent research by media effects scholars has employed outdated theories of development, particularly cognitive development (McAlister & Cornwell, 2009; Moses & Baldwin, 2005). The most cited research done on this subject was conducted thirty to forty years ago and was, as would be expected, a product of the theoretical climate existing within developmental psychology at that time, which at that time was dominated by Piaget and his followers (Piaget & Inhelder, 1969). Yet, this reliance on a Piagetian perspective is pervasive and persists in the most recent research on children and advertising. Many of the scholars who continue to investigate how children respond to marketing messages explain these responses using Piaget (see Calvert, 2003; Kunkel et. al., 2004). Furthermore, even when researchers do not explicitly work from a Piagetian paradigm, they still tend to use stage-based theories to describe how children develop as consumers (see Valkenburg & Cantor, 2001) although there is recent scholarship that has challenged this theoretical paradigm (McAlister & Cornwell, 2009; Rozendaal, Lapierre, Buijzen & van Reimersdal, 2011).

While Piaget's historic work on cognitive development has earned him his rightful place as the intellectual 'father' of the discipline, the majority of scholars working in the field of cognitive development no longer use his theory to explain development and have spent a great deal of time and publication space to argue why his

specific theory is insufficient and problematic. Others note that Piaget's conceptualization of development is too broad (Wellman & Gelman, 1998), it underestimates certain abilities in children while overestimating others (Gelman & Baillargeon, 1983; Kahneman, Slovic & Tversky, 1982) and it does not distinguish between children's perceived competencies and their actual performance (Moses & Baldwin, 2005). As such, it would benefit researchers interested in understanding how children process advertising messages (and communication in general) to examine the current literature on development and adopt more recent research paradigms that provide greater explanatory power than Piaget's theory.

In sum, the current explanations for advertising effects do not adequately account for the actual effects and, as such, need to be revised. Specifically, the collected evidence suggests that the reason used to explain children's vulnerability to advertising messages (i.e., the inability to understand advertiser motives leads to increased advertising susceptibility) is not well supported; it leaves out the role of emotion; and it uses a broader theoretical perspective that now resides mostly in the historical accounts used during the era when advertising effects were first described.

The Proposed Model

To advance this body of research, I am proposing a significant shift in the theoretical mechanisms that explain how children respond to persuasion, with a specific focus on television based persuasion. The reason why television based persuasion is the primary focus for this study is due to the fact that while interactive media has made significant inroads in American homes, television still represents the most attended to medium in children's homes (Lapierre, Piotrowski & Linebarger, 2011). This model

examines three components of cognitive/affective development and how they influence children's responses to advertising: children's developing social cognitive abilities, their cognitive complexity and their cognitive control capabilities. This dissertation tests these three components of cognition and I believe this model will provide a more complete explanation of how advertising, in the form that children are most likely to see, affects them. Moreover, this model is informed by recent research in neurological and cognitive development. Specifically, it focuses on the role that the prefrontal cortex (PFC) plays in persuasion understanding and persuasion resistance, which is a notion that has been suggested by others (see Moses & Baldwin, 2005).

Over the last two to three decades, scholars who specialize in the development of cognition have shifted to more nuanced understandings of how children think (Moses & Baldwin, 2005). Rather than putting children into pre-operational or concrete-operational 'stages', they found that children's thought becomes more complex within certain domains over the course of their development. These observations have led to the creation of testable hypotheses as well as methodological ways to compare the development of one child with another child. The focus has shifted from trying to understand the typical course of development across all children (referred to as the "developmental function") to figuring out how the developmental function might be mediated by individual difference variables; that is, cognitive advances arise from an interaction between the typical developmental trajectory and the experiences and predispositions of any individual child.

Much of this theorizing has both arisen from and led to certain advances that allow for the identification of neural correlates responsible for development (see Bunge

& Zelazo, 2006; Cunningham & Zelazo, 2007; Liu, Sabbagh, Gehring & Wellman, 2009). This shift to a neurological basis for explaining cognitive development offers a great deal more explanatory power over the older theoretical perspectives as researchers can refer to specific brain areas to explain developmental differences and then test whether brain activity in these areas occurs as the result of particular stimulation. While this project does not directly examine neural correlates associated with advertising effects, it does make inferences about these correlates based on assessments of cognitive abilities that have been previously linked to brain function. Further, it brings new testable hypotheses to a body of literature that currently lacks an adequate explanation for advertising effects on children.

Cognitive and Affective Development

This dissertation focuses on three aspects of cognitive and affective development and how they link to a child's (in)ability to process and understand advertised messages: social cognition as it relates to a child's Theory of Mind; cognitive/affective control as indexed by emotion regulation; and cognitive complexity arising from a child's executive functioning. Theory of Mind (ToM) is the study of how and when children become aware of, and act in response to, other people's thoughts, feelings and intentions. Emotion regulation is the study of when and how children begin to control their affective responses to given stimuli using underlying cognitive mechanisms. Executive function refers to when and how children begin to execute planned behavior, reduce interference, and control attention.

All three of these abilities typically start maturing during the early preschool years and do not finish maturing until late childhood or even adolescence (Diamond,

2002; Welsh, Pennington & Grossier, 1991). Furthermore, these constructs are linked to each other in the literature, suggesting a potential common thread to explain their development (Carlson & Wang, 2007; Zelazo & Cunningham, 2007; Liebermann, Giesbrecht and Müller, 2007). Specifically, a number of researchers have noted that these three areas of children's development share a common neurological link, the maturation of the prefrontal cortex (Bunge & Zelazo, 2006; Liu, Sabbagh, Gehring & Wellman, 2009; Zelazo & Cunningham, 2007).

Located in the forebrain, the PFC is the part of the brain chiefly responsible for the regulation of behavior and for complex rule use (Bunge & Zelazo, 2006; Luciana & Nelson, 1998). With a less mature PFC, children are not as competent at executing a number of behaviors including; carrying out goal directed behavior, regulating attention, considering others' belief states, controlling affect, and accessing working memory (Bunge & Zelazo, 2006; Davidson, Putnam & Larson, 2000; Liu, Sabbagh, Gehring & Wellman, 2009). Moreover, as studies with adults have shown, those who have significant impairment of the PFC (e.g., the Psych 101 mainstay- Phinneas Gage) may initially present as normal but, when taxed or stressed, actually exhibit multiple deficits in normal functioning including an inability to control emotional impulses and an inability to plan or focus on long range tasks (Beauregard, Lévesque & Bourgouin, 2001).

The period of most rapid PFC development occurs between the preschool years (i.e., between 3 and 4 years of age) and middle childhood (i.e., between 9 and 11 years of age: Luciana & Nelson, 1998; Welsh, Pennington and Grossier, 1991). I contend that the child's ability to understand persuasion and thoughtfully consider appeals depends

heavily upon the general maturation of this area in the brain and specifically on the development of the three cognitive/affective skills mentioned above.

According to this model, ToM, emotion regulation, and executive function are all part of the child's development and, by the nature of each of these abilities, are linked to key persuasion variables. I further propose that the ability to process advertisements is actually a product of two distinct competencies: understanding of persuasive and selling intent, which rely upon social cognitive competencies, and resistance to persuasion, which relies upon cognitive control and complexity. In the following pages, I will show just how each of these constructs link to persuasion understanding and advertising susceptibility.

Social-Cognitive Development and Persuasion Understanding

The study of children's Theory of Mind is a research area that looks at how children come to develop an awareness of other individual's mental lives and motivations. What scholars in this field have learned is that very young children (children younger than 3) have difficulty understanding that other people have desires, beliefs, knowledge and motivations, which might differ from their own (Perner & Lang, 1999). Yet, as children get older, they gradually begin to learn that other people have distinct mental states and will act in accordance with those mental states, with certain abilities (e.g., understanding of differing desires in individuals) developing earlier than others (e.g., understanding of differing belief states; Wellman & Liu, 2004).

The development of children's theory of mind provides a very nice fit for describing how children come to understand persuasive messages. As I will detail in greater depth below, the same skills that come with the maturing theory of mind abilities

maps nicely onto what children need to understand in order for them to comprehend the intent of messages. Currently, there are only three scholarly works that have explored how theory of mind development influences either persuasion understanding or brand knowledge. The first of these was an essay by Moses and Baldwin (2005) which offered tremendous insights into how theory of mind applies to research on children and advertising, as these two scholars approached this subject from their own experiences as developmental researchers.

The second of these examinations was from McAlister and Cornwell (2009), they tested whether preschool children's theory of mind development was linked with their persuasion knowledge for five print advertisements. They found that children who did better on their slate of theory of mind tasks were more likely to understand advertising appeals, even after controlling for age and linguistic competence. It is important to note, however, that the measure of persuasion understanding was quite limited. Specifically, because of the young age of the children (the mean age was approximately four years), the researchers only examined whether these children understood that advertisements were linked to consuming the product and did not differentiate between differing facets of these appeals (e.g., whether the advertisements were informative vs. persuasive).

The last of these investigations was also from McAlister and Cornwell (2010) and again focused on the consumer competency of preschool children. While this study did not explicitly test children's persuasion understanding, these researchers did examine whether children's theory of mind significantly predicted their brand awareness. The study found that children with more nuanced understandings of social cognition were indeed more likely to understand brand symbolism. With the studies by McAlister and

Cornwell (2009, 2010), and the essay by Moses and Baldwin (2005); a picture is beginning to emerge regarding how social cognition development influences consumer understanding. Specifically, theory of mind competencies are a key factor in determining whether children understand persuasive messages and tactics.

However, to date, there have been no empirical investigations that have tested the relationship between theory of mind development and a more nuanced understanding of advertising messages or marketing tactics, particularly with older children. The closest researchers who study children and advertising have gotten with investigating social cognition within this age range is testing how a child's perspective taking ability predicts advertising understanding (Chernin, 2007; Faber, Perloff & Hawkins, 1982). While these constructs are related concepts, as I will show below, there are significant differences between theory of mind and perspective taking. Specifically, while perspective taking might be considered a subset of this cognitive ability, theory of mind encompasses other elements of cognition that extend beyond simple perspective taking (e.g., semantic understanding- Astington & Jenkins, 1999; communicator intent- Ziv, Solomon & Frye, 2008)

Why should the research on theory of mind have any import for how children process advertising messages? At the heart of both these research programs is the attempt to uncover how children come to understand the ways that other people behave and how belief states influence behavior. In fact, I would argue that understanding persuasion represents an advanced development in the child's theory of mind. In order for the child to recognize that he or she is a target of a persuasion attempt, the child must not only appreciate that other people have feelings and motivations that are separate from their

own, they must also come to realize that those doing the persuading are actively trying to change the child's own attitudes and belief states (Bartsch, Wade, & Estes, 2011).

In addition, when considering that children are most often required to successfully decode persuasive messages that do not actually 'look' like overt persuasion attempts, the ability to discern masked intentions should be critical (i.e., children must develop some level of cynicism or sarcasm). Lastly, there is evidence from other areas of child development which would suggest that persuasion understanding is linked to theory of mind development as these areas conceptually overlap with understanding persuasion. Research in the areas of children's understanding of teaching (Davis-Unger & Carlson, 2008; Ziv, Solomon and Frye, 2008), the *creation* of persuasive appeals (Bartsch & London, 2000; Bartsch, London & Campbell, 2007; Bartsch, Wade, & Estes, 2011) and both the understanding and practice of deception (Hala, Chandler & Fritz, 1991; Sodian, Taylor, Harris & Perner, 1991; Talwar & Lee, 2008) are all related to theory of mind development. Over the next few pages, I will outline how different elements from the theory of mind literature can help us to understand how children come to recognize persuasive messages.

One of the most elementary things that children must realize if they are to understand persuasion is to begin to understand that other people have different desires, beliefs and motivations than they do. If we accept the most basic definition of persuasion, which is that persuasion deals with the intentional (in the case of commercial advertisements) changing of another's behaviors, beliefs or attitudes, then knowing that beliefs or desires vary from person to person should be essential to understanding persuasion (O'Keefe, 2002).

For example, in research on children's theory of mind development, one of the first skills children acquire is the awareness that other people can have false beliefs (i.e., beliefs whose content contradicts reality- Wellman, Cross & Watson, 2001). A commonly used test to determine if a child has developed this ability is to tell the child a story about two children (Tommy and Billy) who have decided to share a chocolate bar (Wimmer & Perner, 1983). The characters in the story decide to put the bar in the refrigerator. After Tommy leaves the room, Billy changes his mind, takes the candy bar out of the refrigerator and instead puts it in a cupboard. Billy, after moving the candy leaves the room and Tommy re-enters. At this time, the researcher asks the child where Tommy will look for the candy bar. Children who have developed an understanding of false belief will correctly assert that Tommy will look in the refrigerator, while children who have not developed an understanding of false belief will assume, incorrectly, that Tommy will look in the cupboard.

The reason why young children make this mistake is that they believe all people have access to the same information. For those children without the knowledge that other people have minds and beliefs and independent from their own, they assume that Tommy knows what they know, which is that the candy bar has been moved to the cupboard. On the other hand, children who successfully complete this task not only demonstrate an awareness of other's mental states, they also have shown that they understand how another person will *act* based upon these mental states (i.e. they are aware that since Tommy believes the candy bar is in the refrigerator he will look there).

As numerous investigations have revealed, the ability to understand that other people have differing desires and beliefs develops rather early in most children, with the

majority of children arriving at some understanding of false-belief knowledge between the ages of 3 and 5 (see Wellman, Cross & Watson, 2001 for a meta-analysis on the acquisition of false belief). Furthermore, as Wellman and Liu (2004) showed in their study on the acquisition of young children's theory of mind, these skills appear to follow a fairly consistent pattern in young children, with certain skills (e.g., knowledge of other's desires) developing before others (e.g., understanding that physical displays of emotion are not the same as felt emotions).

Knowing that other people have separate beliefs/desires and will therefore act according to those mental states should represent a milestone in understanding persuasion. For example, consider a child who does not understand the variability associated in other's mental states and how they may receive a persuasive message. For this child, the very notion that someone else has a separate set of beliefs (e.g., the belief that cereal X is a good cereal) is beyond their understanding. Instead, the very statement "cereal X is a good cereal", is a statement that describes reality. On the other hand, those children that have developed an understanding of other people's minds should be able to recognize that such a statement is merely an expression of a belief state.

However important the child's development regarding knowledge of other's minds is, there is still more that the child needs to learn before they can understand the intent of persuasive messages. The abilities outlined above, only refer to first-order beliefs (i.e. beliefs about someone else's mental state) and not to second-order beliefs (i.e. beliefs about someone else's mental state regarding *another* person's mental state) which have been shown to develop later than first-order beliefs (Perner & Wimmer, 1985).

For example, in their test of second order beliefs Perner and Wimmer (1985) presented children with the story of two characters, John and Mary, who were going to get some ice cream from an ice cream truck. John and Mary are originally told that the ice cream truck is going to be at the library. Yet, afterwards, they are both told, independently from one another that, the truck has moved to the beach. Now, both John and Mary know where the truck is, but John believes that Mary thinks the truck is still at the library. It is here we see that John's second-order belief is false (i.e. that Mary thinks the truck is at the park). Children are then asked where John thinks Mary is going to go to get ice cream. Children who do not understand second-order beliefs will state that John thinks Mary is going to go to the beach to get ice cream, rather than the library.

The development of second-order belief understanding should help children with understanding persuasive messages; in fact, I would contend that understanding second order belief states is a necessary and sufficient condition for understanding the selling-intent of advertisements. Unlike children with only first-order understanding, the children with second-order understanding will be able to understand that persuasive messages will change another person's belief, namely, their own. For instance, if we take the example given above about the cereal (cereal X is a good cereal), children with a less mature conceptualization of belief states will correctly see this statement as a statement about beliefs. Yet, they will most likely be unable to discern, unlike children with more mature conceptualizations of beliefs, that the statement is designed to act on another's set of beliefs (i.e., the message is designed to change their mind).

In terms of when this understanding of second-order beliefs develop, the research suggests that children are not able to understand these types of questions until after pre-

school, with most children finding success by age seven (Hogrefe, Wimmer & Perner, 1986; Perner & Wimmer, 1985). However, there is not complete unanimity on when children develop this ability. Sullivan, Zaitchik and Tager-Flusberg (1994) found that when the tasks were worded more simply, children in preschool were capable of understanding them. Nevertheless, it appears that before children can understand other's beliefs *about* other's beliefs they must first understand these first-order theory of mind questions.

There is still, however, a further set of social-cognitive competencies that should help children understand persuasive messages. While children with second-order understanding of mental states are able to see that beliefs/desires are embedded within other mental states, there is still the question of whether they understand that other people will present their beliefs in such a way as to hide their biases, blunt their preferences or mask intentions. In other words, that people are active interpreters of information and not just copying the world around them (Lalonde & Chandler, 2002).

A clear difference in how children of varying theory of mind understanding approach these types of issues can be seen in how they interpret irony or sarcasm. Filippova and Astington (2008) looked at how children of differing ages reacted to stories where the antagonist in the story gave a sarcastic response to the protagonist (e.g. in a story where Robert misses a number of shots in a basketball game, his teammate Oliver says to him- "You sure are a GREAT scorer"). They found that children who could correctly interpret the meaning of Oliver's statement were more likely to demonstrate advanced (i.e. interpretive) theory of mind.

This ability, to take into account someone's biases when trying to understand their actions, is something that develops much later in children when compared to understanding first-order or second-order mental states (Banerjee, 2000; Fillapova & Astington, 2008; Lalonde and Chandler, 2002; Pillow & Weed, 1995). In these various studies, it does not appear that children are fully equipped to understand an "interpretive" theory of mind until second grade (e.g. Lalonde and Chandler, 2002) or even fourth-grade (e.g. Fillapova & Astington, 2008).

Yet, reaching this conceptual threshold should prove to be extremely beneficial for children when it comes to understanding persuasive messages, especially when considering the types of persuasive messages children are most likely to face when watching television. Whereas children who have knowledge of second-order mental states will be able to see that someone delivering a persuasive message is intending to change their beliefs, it should only work if the persuasion attempt is clear. However, as noted above, the typical commercial messages that children are most likely to encounter mask their intent (Buijzen & Valkenburg, 2002; Page & Brewster, 2007). Consequently, children who have an advanced understanding of mental states and how they predict other's behavior should be able to interpret these messages.

Implications for Understanding of Persuasion

Taken all together, there is clear reason to believe that children's theory of mind development maps well to their understanding of persuasive messages. Each of the substantive changes in theory of mind is linked to key differences in persuasion understanding. For example, when looking at what is considered the most complete accounting (Roberts, 1982) of the skills needed to protect children from advertising

messages (see Kunkel, 2010), it is striking how strongly these separate skills match-up with key components regarding theory of mind understanding.

As Roberts (1982) suggests, children must master four concepts before their advertising knowledge can be rightfully considered mature. These concepts are (1) recognize that the receiver and the advertiser have differing interests and perspectives on the world, (2) that the advertisement is intended to persuade, (3) that persuasive messages are potentially biased and (4) that biased messages require different strategies to interpret than informational or educational messages. The development of first-order understanding is necessary to understand step one in Roberts' conceptualization, the development of second-order theory of mind is necessary for step two and the development of an 'interpretive' theory of mind is required before children can understand steps 3 and 4.

Moreover, children's theory of mind competency can be reconsidered in a way that can help us to uncover how social cognition influences communication understanding. Specifically, tests investigating theory of mind development in the current study can be placed into two distinct categories: examinations of the individual's knowledge regarding others' cognition (Perner & Wimmer, 1985; Wellman, Cross & Watson, 2001) and examinations of the individual's knowledge of communicative intent (Filippova & Astington, 2008). For example, the test of false belief knowledge is a test of whether a person is simply aware of another person's knowledge state, while the test of real-apparent emotion requires that a person be able to 'unmask' an individual's communicative intent. What is interesting about this difference is that knowledge of persuasive and selling intent is essentially about 'unmasking' advertising messages to see

their true intent. Knowledge of persuasive and selling intent is about seeing these messages for what they are as opposed to what they appear to be and would ostensibly require some measure of affective or emotional sophistication to parse them. On the other hand, knowledge of other's beliefs/thoughts would likely not require any additional affective or emotional sophistication; instead, it demands a certain measure of pure cognitive skill/ability which primarily relies on awareness of knowledge states. With this in mind, in addition to testing whether theory of mind predicts advertising understanding, this study will also determine whether advertising understanding is linked more strongly with cognitive abilities (via tests of false beliefs) or with being able to unmask communicator intent (via tests of affective/emotional communication). As such, I propose the following hypotheses and research question:

H1a. *Children's increased performance on the theory of mind tasks will be positively associated with their knowledge of selling intent, after controlling for age and language fluency.*

H1b. *Children's increased performance on the theory of mind tasks will be positively associated with their knowledge of persuasive intent, after controlling for age and language fluency.*

RQ1. *Which of the theory of mind tasks will be the strongest predictors for children's knowledge of selling and persuasive intent?*

As noted in the preceding hypotheses, it is important to keep in mind that when considering theory of mind and its link to consumer understanding is that there is a differentiation between knowledge of selling intent and knowledge of persuasive intent (Kunkel, 2010). Knowledge of selling intent entails whether the individual is aware that

marketing messages are designed to encourage commercial behavior, while knowledge of persuasive intent entails whether the individual is aware that marketing messages are designed to change opinions about the product. Initial research on these two aspects of consumer knowledge has shown that knowledge of persuasive intent develops later than knowledge of selling intent (Owen et al., 2011). In fact, this research suggests that children develop knowledge of persuasive intent significantly later than knowledge of selling intent.

H2. *Children's knowledge of selling intent will precede their knowledge of persuasive intent.*

Cognitive Control and Persuasion Processing

The more important notion that must be addressed is the idea that even if we grant that children can spot the persuasive thrust of a message *and* have the necessary knowledge in place to help them defend against advertisements, it does not necessarily follow that children will actually *enact* these defenses. First, children must have the necessary skills that will allow them to exert cognitive control, which will thereby give them the ability to stop and recognize the persuasive nature of the communication. Second, the child will need to think about the persuasive message in some considerable depth (e.g., think about who the source of the message is; recognize the bias in the advertising). In this section, I will explain how the development of both executive function and emotion regulation should be key determinants of advertising processing, susceptibility, and subsequent consumer behavior.

Executive Functioning

Executive functioning is defined as the 'higher order, self-regulatory, cognitive processes that aid in the monitoring and control of thought and action' (Carlson, 2005; pg. 595). Executive function is not a singular construct or skill but a set of skills that aid in carrying out purposeful goal directed thought and behaviors (see Zelazo, Müller, Frye & Marcovitch, 2003). The skills traditionally cited as components of executive functioning include inhibition control (i.e., the ability to control a cognitive response to a stimuli), impulse control (i.e., the ability to control an emotional response to a stimuli), attentional flexibility (i.e., the ability to focus attention with decreased effort), working memory proficiency (i.e., the ability to keep increased information immediately in mind), planning (i.e., the ability to stick to an assigned goal), set-shifting (i.e., the ability to move easily between cognitive tasks) and resistance to interference (i.e., the ability to ignore extraneous cognitive stimuli- Carlson, 2005; Zelazo, Carter, Reznick & Frye, 1997).

The development of executive functioning has been linked to a number of key outcomes in both children and adults (Blair, Zelazo & Greenberg, 2005). Children that evidence greater competencies regarding executive function tend to perform better in social situations (Hughes, 2002) and are better equipped to consider the thoughts, feelings, and mental states of others (Carlson & Moses, 2001). Children with more robust executive function also do significantly better in academic settings, even when controlling for age and IQ (Blair, Grainger & Razza, 2005; Carlson, Moses & Breton, 2002). In addition, as Moses and Baldwin note in their essay from 2005, the development of executive function should be closely tied to persuasion processing in young children, I will extend the thoughts on this subject a bit by explicitly noting how differing aspects of

executive function influence persuasion processing. The aspects of executive functioning that are of interest in the current examination are- inhibition control, attentional flexibility, and working memory.

Executive Function and Message Processing

One aspect of cognitive control under the umbrella term of executive function is inhibitory control, which is the 'ability to withhold a pre-planned response, interrupt a process that has already started, avoid interference and delay a response' (Tamm, Menon and Reiss, 2002). Those children who have not developed inhibitory control struggle with exerting cognitive control over certain actions and thoughts when faced with complex stimuli (Carlson, Moses & Claxton, 2004). For instance, younger children routinely have difficulty with controlling inhibitions while playing the game 'Simon Says', where the child must copy the actions of a leader, but only when the leader gives the child permission by saying 'Simon Says'. Children who cannot control their inhibitions are more likely to perform poorly when playing this game, as they are unable to control their responses to the leader's false prompts once they have cognitively fixed to the response (Carlson, 2005).

The second aspect of executive function that should influence persuasion processing is the development of attentional flexibility, which reflects the child's ability to shift attention while encountering interference (Hughes, 2011). The ability to shift attention when faced with interfering stimuli is evident in the Flanker Task (Simonds et al., 2007). In this test, participants are asked to determine the direction an arrow is pointing while faced with either congruent or incongruent stimuli (e.g., arrows pointing either in the same or opposite direction). Those who are faster at sorting through the trials

with incongruent arrows have more proficient attentional flexibility than those who take longer on these trials.

Lastly, the development of working memory is an essential component of executive function (Hughes, 2002). Working memory is that part of memory, which keeps information immediately accessible for the planning and completion of complex tasks and is what allows us to complete ordinary multi-tasking operations without becoming completely overwhelmed (Welsh, Pennington & Grossier, 1991). The ability to keep information immediately present in the memory and to use these memories to complete tasks efficiently can be seen with the Tower of London task (Luciana & Nelson, 1998). In this task, participants must move a series of prearranged discs, in as few moves as possible, into a separate ordering. While success on this task is strongly linked to planning behavior (Luciana & Nelson, 1998), a vital aspect related to success on the task requires that participants remember how all of the different moves fit with one another (e.g., they must maintain a script of moves in order to minimize superfluous moves).

With the preceding findings in mind, I predict that children with immature executive functioning will have a more difficult time processing certain types and/or elements of commercials. Specifically, because children are less able to control inhibitions they will be more likely to respond to the perceptually salient and pleasing parts of the message. Then, because these children have a hard time shifting and controlling their attention, they will be unable to adequately attend to and process the central (and less perceptually salient) components of the message. Finally, due to their immature working memory capabilities and the frenetic nature of the advertisements, less cognitively mature children will be unable to keep all of the message components in mind

and will thus have a difficult time processing and subsequently remembering the arguments contained in the message. With this in mind, I propose the following:

H3a. *After controlling for age and language fluency, children's performance on executive functioning (both the executive functioning tasks and parent report of executive functioning) will be negatively associated with advertising susceptibility.*

H3b. *After controlling for age and language fluency, children's performance on executive functioning (both the executive functioning tasks and parent report of executive functioning) will be negatively associated with child-reported purchase desire for advertised products.*

I further expect that children with less mature executive functioning will be generally more likely to make purchase requests to their parents, as such, I propose an additional hypothesis:

H4. *After controlling for age and language fluency, children's performance on executive functioning (both the executive functioning tasks and parent report of executive functioning) will be negatively associated with parent-reported purchase requests.*

Emotion Regulation

The study of emotion regulation as a unique research area is a somewhat recent occurrence (Gross, 2007). Initial work was done on the subject in the mid-1980s (see Saarni, 1984), but it was not until the early 1990s that emotion regulation was thought of as its own particular construct with scholars working to identify how it developed or what actually constituted emotion regulation. Yet, by working within this conceptual

framework, researchers have been able to piece together some compelling discoveries related to both children and adults. In particular, children who are able to regulate emotion effectively enjoy more social success, as these children are more popular, show more social competence and are more sympathetic to the plight of others (Denham et. al., 2003) Most importantly, however, researchers in this area have begun to systematically re-entangle (rather than disentangle) the relationship between emotion and cognition (Damasio, 1994).

Emotion regulation is defined as 'the behaviors, skills and strategies, whether conscious or unconscious, automatic or effortful, that serve to modulate, inhibit and enhance emotional experiences and expressions (pg. 160- Calkins & Hill, 2007)'. This can include either subduing or amplifying both negatively or positively valenced emotions. Examples of emotion regulation at work include stopping oneself from expressing a profane hand gesture while driving, maintaining a somber face when something unexpectedly humorous occurs at a solemn occasion, displaying a guilty demeanor for an infraction that does not actually make you feel guilty and feigning a look of joy when you receive a gift that you actually do not like. Yet, emotion regulation is not an ephemeral happening. The control and modulation of emotional responses can best be described as a process with continuous feedback, as one situation that requires emotion regulation leads to a different situation which also requires the regulation of emotion.

The development of emotion regulation can be properly understood as a gradual transfer from mostly external regulation at infancy to predominantly internal regulation of emotions in young children (Calkins, 1994; Dodge & Garber; 1991).[2] At the very beginning of life, children rely exclusively on their parents, or other caregivers, to soothe

and regulate arousal (Kopp, 1989; Tronick, 1989). For example, if an infant falls down or has a toy taken away, it is the caregiver's responsibility to act as the calming agent and not the child itself, as the child is unable to enact internal emotional controls. Yet, as children move through infancy and toddler-hood, they undergo a number of important neurophysiological changes, which aid in moving the primary responsibility for emotional regulation away from caregivers and onto the child.

During the early to middle elementary school years, children begin to deal with an entirely new set of problems, and that is how to manage both positive and negative emotions in a socially appropriate manner. In regards to the control of emotions in positive situations, we can see how development influences the ways children react to emotional situations based on age. In the Secret Keeping task children are tested on how long they can refrain from revealing some amazing news to researchers (e.g., that a fish can talk) after being told that they cannot reveal this secret to the researchers (Carlson & Wang, 2007). In the negative situations, one task that researchers use comes from the disappointing gift paradigm, wherein researchers tell a child that they are going to receive a wonderful gift. Instead, the researcher gives the child a disappointing gift (e.g., a wooden block, a broken toy). After opening the gift, researchers code the child's reaction and look for a clear indicator that the child either does not like the gift (i.e. negative comments, frowning, shoulder shrugging) or that the child is unable to make a socially appropriate gesture showing gratitude for the gift (e.g., smiling, thanking for the gift). Children who are less skilled at regulating their emotions will openly show disdain for the gift that they have received and as children's emotional skills improve, they will hide their dislike of the product. As children get better at managing emotions, child is able to

produce a reaction, which shows that they like the gift, or are, at least, grateful to the gift-giver for the gift.

In both these tests, the child's ability to regulate their emotional reactions is closely tied to their ability to control cognitions and not let emotional situations overwhelm them, as children who succeed at these tasks are those children who are cognitively able to 'override' their emotional impulses (Carlson & Wang, 2007; Simonds, Kieras, Rueda & Rothbart, 2007). Young children are unable to complete these tasks successfully, while older children are able to perform significantly better. As Simonds and her colleagues (2007) found in their test of children's ability to cope with disappointing gifts, the children who were able to enact an appropriate emotional response to receiving the gift (e.g., smiling and saying 'thank you' for the gift) were the oldest children in the sample (10 years old). Children at this age were the only ones who were consistently able to proactively control their response and enact an appropriate cognitive script rather than just subduing an emotional impulse.

With so much of the content in these advertisements centered on emotional cues, one would expect that the child's ability to process these messages depend on his or her ability to modulate emotional responses to the message. Children with less of an ability to control affect via emotion regulation will be overwhelmed by these emotional cues. Like the children that have a difficult time controlling their reaction to the 'talking' fish in the secret keeping task (Carlson & Wang, 2007), the presence of excited and happy children or popular brand characters in the advertisements could very well over-stimulate younger children.

Younger children's inability to modulate their affective responses should lead them to continue concentrating on the emotionally pleasing aspect of the advertisement. As these children mature and develop the ability to use effective emotional modulating strategies, they will become less likely to get caught up in the message's emotional appeal. Instead, they will be better able to control the emotional impulses evoked by the advertisement and will be less likely to connect emotionally with the commercial message.

H5a. *After controlling for age and language fluency, children's scores on emotion regulation (both parent report and direct assessment) will be negatively associated with advertising susceptibility.*

H5b. *After controlling for age and language fluency, children's scores on emotion regulation (both parent report and direct assessment) will be negatively associated with child-reported purchase desire for advertised products.*

In addition, I contend that children's ability to regulate emotion is a key determinant in whether these same children make purchase requests to parents and can appropriately cope with purchase request denials on the part of their parents (see Buijzen & Valkenburg, 2003a). As such, I propose the following:

H6. *After controlling for age and language fluency, children's scores on emotion regulation (both parent report and direct assessment) will be negatively associated with parent-reported purchase requests.*

H7. *Children's emotion regulation abilities will be negatively associated with parent-child conflict with parents regarding purchase request denials.*

Summary

The dissertation proposes three general sets of hypotheses looking at children's consumer development. The first set of hypotheses predict that children's theory of mind development will influence children's understanding of advertisements and that this effect will hold even after accounting for child age and linguistic competence. The specific hypotheses, as proposed, are the following:

H1a. *Children's increased performance on the theory of mind tasks will be positively associated with their knowledge of selling intent, after controlling for age and language fluency.*

H1b. *Children's increased performance on the theory of mind tasks will be positively associated with their knowledge of persuasive intent, after controlling for age and language fluency.*

RQ1. *Which of the theory of mind tasks will be the strongest predictors for children's knowledge of selling and persuasive intent?*

H2. *Children's knowledge of selling intent will precede their knowledge of persuasive intent.*

The second set of hypotheses predicts that children's development of cognitive control via executive function influence children's desire for consumer products and advertising susceptibility. Specifically, children with more robust executive function (independent of age and language skills) will be less likely to ask their parents for consumer goods, express desire to purchase products and will be less likely to respond favorably to commercial messages. These hypotheses are states as follows:

H3a. *After controlling for age and language fluency, children's performance on executive functioning (both the executive functioning tasks and parent report of executive functioning) will be negatively associated with advertising susceptibility.*

H3b. *After controlling for age and language fluency, children's performance on executive functioning (both the executive functioning tasks and parent report of executive functioning) will be negatively associated with child-reported purchase desire for advertised products.*

H4. *After controlling for age and language fluency, children's performance on executive functioning (both the executive functioning tasks and parent report of executive functioning) will be negatively associated with parent-reported purchase requests.*

The final set of hypotheses predicts that children's affective development via emotion regulation capabilities will affect their desire for consumer products and interactions with parents regarding consumer purchases. I propose that after accounting for the effects of age and language abilities, children with less developed emotion regulation skills will ask more consumer goods and express greater desire to purchase products. In addition, less developed emotion regulation in children will lead to fewer conflicts with parents over denied purchase requests. The specific hypotheses, as proposed, are the following:

H5a. *After controlling for age and language fluency, children's scores on emotion regulation (both parent report and direct assessment) will be negatively associated with advertising susceptibility.*

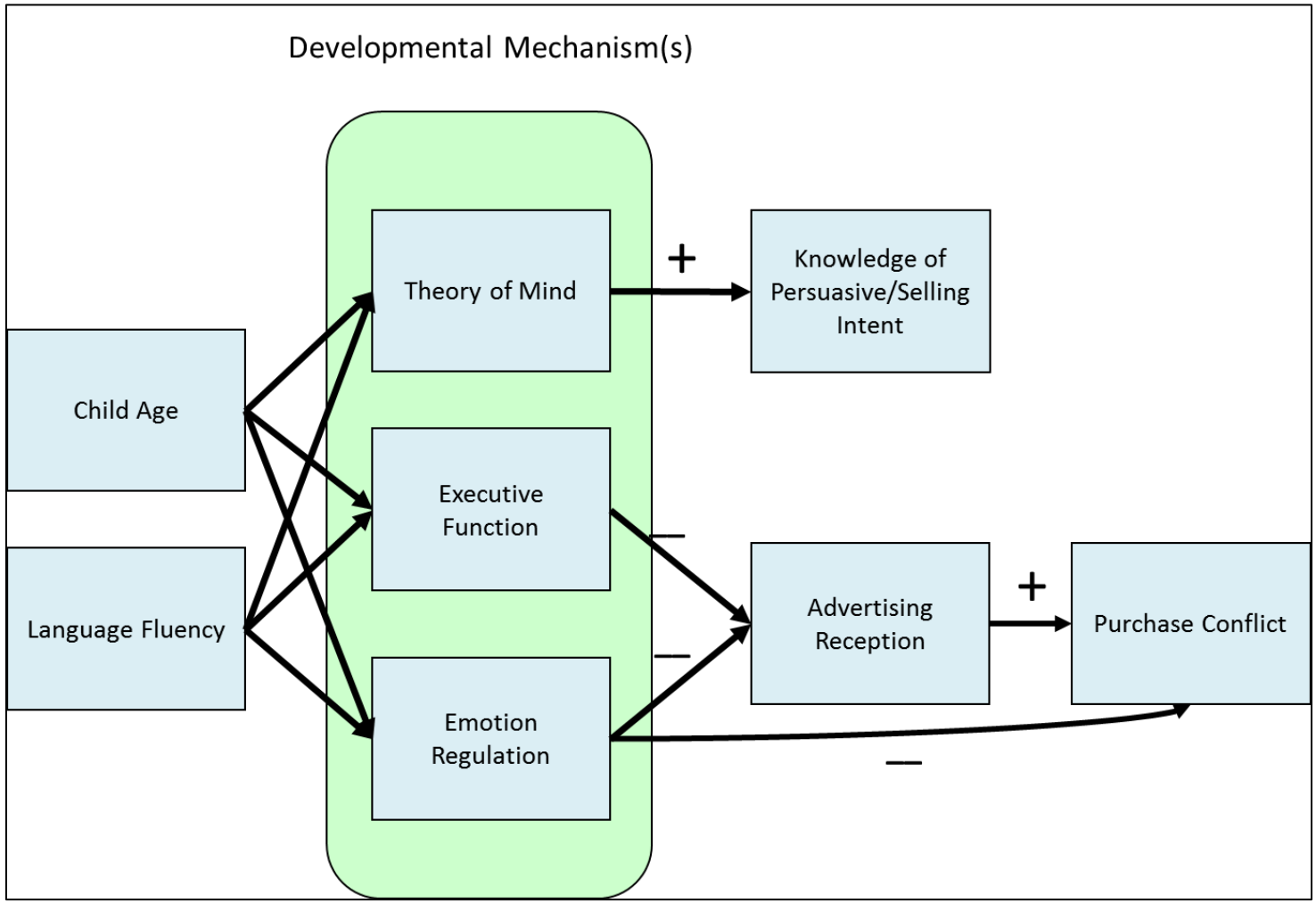
H5b. *After controlling for age and language fluency, children's scores on emotion regulation (both parent report and direct assessment) will be negatively associated with child-reported purchase desire for advertised products.*

H6. *After controlling for age and language fluency, children's scores on emotion regulation (both parent report and direct assessment) will be negatively associated with parent-reported purchase requests.*

H7. *Children's emotion regulation abilities will be negatively associated with parent-child conflict with parents regarding purchase request denials.*

These hypotheses can also be conceptualized graphically. As seen on the following page (Figure one), the relationships under investigation can be depicted as follows:

Figure 1: *Graphical Depiction of Predicted Hypotheses*



Methods

Research Design

This study utilized a number of separate methodologies to assess children's consumer behavior and cognitive development. First, children met with researchers for two in-depth assessments that used both self-report and direct observations. Second, parents were asked to fill out a questionnaire regarding the target child. Lastly, in order to assess children's persuasion susceptibility this study utilized a 2-level (advertisement group A and B) between-subjects experiment. Specifically, approximately half of the children participating in the study were exposed to advertisement group A while the other half of participating children were exposed to advertisement group B. Using this methodology, children in group A served as a control group for children in group B while children in group B served as a control group for children in group A. The logic underlying this approach was that children exposed to the group A (or group B) advertisements would increase their liking and consumption behaviors for the products that they saw advertised relative to the group B (or group A) products/advertisements (which they did not see advertised) and that these changes would be more pronounced in children with less developed executive function and regulatory competencies.

With regard to what advertisements/products were selected, there is a more detailed discussion in Appendix A about the process. Briefly stated, the goal was to find two sets of advertisements that were matched along several dimensions (e.g., time of advertisement, format of advertisement, product type) and would have the same persuasive influence on children. A pilot study was conducted with children between the ages of 6 to 9 where these children watched twenty advertisements for various products

and were asked how much they liked the advertisement and the product. After looking at the results of child ratings for the products/advertisements and advertisement/product similarity, four advertisements/products were shown. Specifically, children in group A would be exposed to advertisements for Froot Loops cereal and D'animals Coolision yogurt snacks while children in group B would be exposed to commercials for Trix cereal and Yoplait Splitz yogurt snacks.

Participants

Study Sample. Children and parents were recruited from six after-school programs and three day camps in the greater Philadelphia area, all childcare centers were associated with a larger childcare organization. The children and parents were recruited in a two-step process. First, research staff spoke with the assembled children in the childcare settings to explain the study and answer questions from the children. Second, research staff spoke individually with parents when they came to pick their child up from the childcare setting. Researchers explained the purpose of the research, described the study procedures, and answered any questions that parents had.

In accordance with the Institutional Review Board at the University of Pennsylvania, this childcare organization was required to provide written consent indicating participation agreement while parents were required to provide written consent for their children to participate as well as provide written consent to record their child's participation and to eat during the data collection. The childcare organization was compensated $800 in the form of gift certificates to educational supply stores. Participating children received small toys and stickers as compensation after each assessment. Parents who completed the parent survey were compensated $10 in cash.

Eighty-two signed consent forms were returned. One child did not complete any of the assessments, another child did not finish the second assessment, and one family did not return the parent questionnaire. As such, data from 79 children between the ages of 6 to 10 (i.e., 72 to 119 months) and their parents were included in all study analyses. This age criterion for the current study was based upon previous research on the development of children's advertising understanding (Kunkel et al., 2004) and children's cognitive and affective development (Simonds, Kieras, Rueda, & Rothbart, 2007). Specifically, previous studies and theorizing on children's understanding of and response to advertising have indicated that the ages between 6 to 10 represent a crucial time in children's lives regarding consumer development (see Calvert, 2003; Kunkel et al., 2004; Valkenburg & Cantor, 2001; Ward, Wackman & Wartella, 1977).

Of the 79 children, females represented 50.6% (n = 40) of the sample. The average age of the children in the sample was 7.70 years (SD = 0.88) with significant differences in age between genders (F (1,78) = 4.46, $p < .05$; Mean $_{\text{males}}$ = 7.90, SD = 0.86; Mean $_{\text{females}}$ = 7.50, SD = 0.86). Random assignment resulted in equal group size. Forty children (18 males) were assigned to the group A advertisement condition while 39 children (21 males) were assigned to the group B advertisement condition. Neither gender ($\chi^2(1) = 0.62$, $p = .43$) nor age (F (1,78) = 0.14, $p = .71$) were significantly different across these randomly assigned conditions.

Demographic information regarding the participating children and their families was gathered via parent surveys. Of the 79 participating children, 11.4% parents reported that their child had a special need that could interfere with learning. Of those responding to the question of child race (n = 77 parents), 81.8% of the children were identified as

White (n = 63) followed by 11.7% of the children identified as multi-racial (n = 9), with the remaining children identified as either African American (n = 2) or East Asian/Asian (n =3).

Slightly over 96% of the responding parents (n = 76) reported maternal education. Of these respondents, 38.2% of mothers had a high school diploma, some college, or an Associate's degree (or vocational degree). Nearly 29% (n = 22) reported holding a Bachelor's degree and slightly over 31% reported holding a Master's Degree or higher (n = 24). The remaining respondents (1.3%, n = 1) reported less than a high school diploma. Regarding paternal education, 72 of the respondents (out of 79 respondents) reported this information. Of these respondents, 58.3% (n = 42) stated that the primary paternal figure had a high school diploma or Associate's degree, 23.6% (n = 17) had a Bachelor's degree, 16.7% (n = 12) reported that the father figure had a Master's degree or higher, and 1.3% (n = 1) of paternal figures did not have a high school degree.

Family size averaged 3.8 members, ranging from 1 to 6 persons. Reports of annual family income (based on 73 responses) suggest that parents and children participating in the study came from middle to upper-middle class homes. The median family income for families participating in the study was between 90,000 and 105,000 dollars. Only 9.3 % of parents (n = 7) stated that their child was eligible for free or reduced lunch, another 6.7% (n = 5) stated that they did not know whether their child was eligible for free or reduced lunch (a total of 75 parents provided responses to this question).

There were no significant differences by condition for any of the reported demographic variables. See Appendix B for demographic information by condition, as well as significance tests by condition.

Procedures

After obtaining approval from the Institutional Review Board at the University of Pennsylvania, a small study was conducted to find appropriate commercial messages for the main study. As detailed in greater depth in Appendix A, fourteen children between the ages six and ten were shown twenty advertisements. The advertisements were for products that were primarily targeted to children and were currently airing at the time of the pilot study. After viewing each of the advertisements, children were asked if they recognized the product, how much they liked the advertisement, and how much they liked the product. Children's responses to these questions were compared across advertisements with a particular focus on advertisements that were similar along a number of different dimensions. The goal was to find advertisements/products that children responded equally well to and shared many of the same features. The specific features that were targeted were format (live action vs. animated), editing features, product type (cereal vs. toy vs. snack), and time of advertisement (15 sec. vs. 30 sec.). The results of this study identified four advertisements that children were likely to find persuasive and were associated with products that children indicated liking (but did not like too much so as to not encounter ceiling effects). In addition, these advertisements were for products that were quite similar to one another, as there were two advertisements for fruit-flavored corn based cereal- Trix and Froot Loops, and two advertisements for yogurt snacks- Yoplait Splitz and D'animals Coolision.

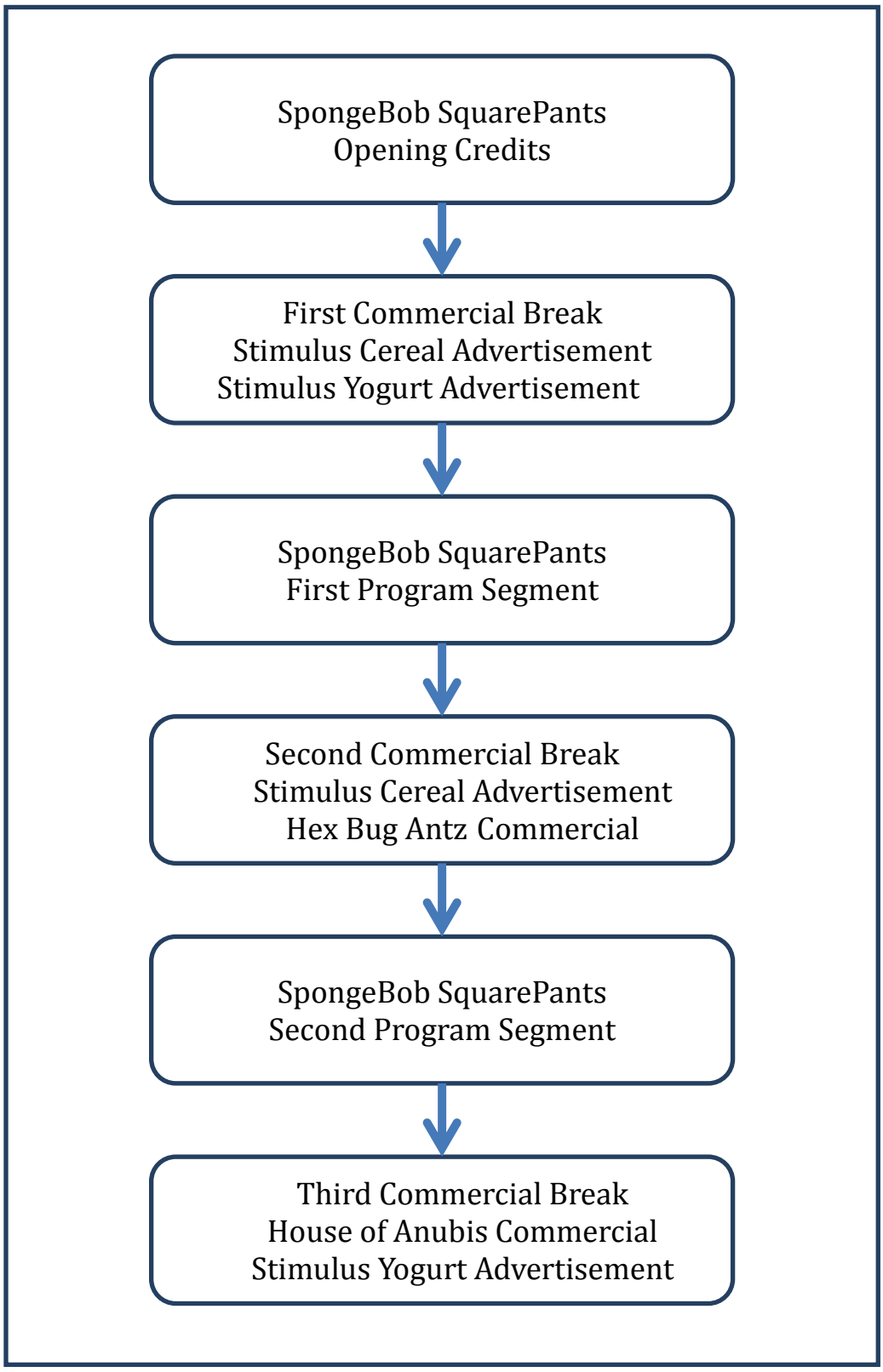
Once the pilot study was completed, the full study commenced. The research design employed a parent questionnaire and two interview sessions with children. The questionnaire for parents was sent home along with the child consent form and description of the study. Prior to children's data collections, all children were randomly assigned to one of two viewing conditions: exposure to group A advertisements or exposure to group B advertisements. All testing was conducted within available spaces in the children's respective childcare programs (each of the after-school programs and day camps were held in public elementary schools). Because children were asked about their opinions regarding the advertised products in the first assessment, there was some concern that the perceived demand characteristic manipulation for the experimental stimuli would fail because all children would anticipate questions about the products post-viewing. In an effort to decrease this expectation, post testing was required to occur at least 14 days after pretest (Median = 17 days after pretest, Mean = 18.0 days, SD = 6.1; some exceptions were made due to student absences and reduced access to the childcare program). There was no significant difference by condition in terms of length of time between pretest and posttest, $F(1,78) = 0.0$, $p = 1.00$.

During the first testing session, children completed assessments to evaluate their opinions regarding an assortment of toys (for the emotion regulation test), a pre-test of product attitudes and purchase desire, executive function tests, working memory test, persuasion knowledge, and test of emotion regulation. During the second session, children took part in a theory of mind assessment, expressive language test, experimental stimulus exposure, post-test of product attitudes, and test of emotion regulation.

The experimental stimulus was comprised of advertisements embedded within a half-episode of the show *SpongeBob SquarePants*. This show was selected because it is widely viewed by children in the targeted age range and is appealing to both boys and girls (Blair, 2009). The half-episode that children watched featured a storyline where the main character, SpongeBob, and his friend Sandy Squirrel comically spar using their martial arts skills and this sparring leads to SpongeBob almost losing his job.

During this episode, children saw advertisements for either Froot Loops/D'animals Coolision or Trix/Yoplait Splitz, advertisements for each product were presented twice to children within three commercial breaks. All of the commercial breaks were edited into the episode by an audio-visual professional. All stimulus advertisements presented to children were 30 seconds in length. The first commercial break came after the opening credits for the show and first featured the commercial for the fruit flavored cereal followed by the commercial for the yogurt snack. The second commercial break was edited into the episode (*SpongeBob SquarePants* does not utilize commercial breaks in the middle of their half-episodes) and first featured an advertisement for the toy *Hex Bug Ants* followed by an advertisement for the fruit flavored cereal. The last commercial break came at the end of the episode and first featured a promotion for the show *House of Anubis* and ended with a commercial for the yogurt snack.

Figure 2: *Sequence of Advertisements for SpongeBob SquarePants Episode*



Before viewing the episode of *SpongeBob SquarePants*, children were told that because they had been so helpful, they would have the opportunity to watch the show and would be given a snack while they watched. The children were told that they would be able to snack on either *Froot Loops* or *Trix* while they watched the show and that they could have as much cereal as they wanted. The only restriction placed on children was that they could not mix the cereals, since the cereals would be weighed later. The cereal was presented to children immediately before the first advertisements were aired. After the episode aired, all of the cereal was weighed to determine how much was consumed. The cereal was returned to children after weighing, and was weighed again after the child completed the product attitude measure.

Apparatus

All viewing and testing was conducted using the same approximate set-up, materials, and viewing apparatus to help ensure that the viewing experiences were as standardized as possible for each child. All viewing was conducted on two identical Dell 15.6 inch widescreen LCD computers with built-in DVD players. All video recording was conducted using two identical Sony digital video camera recorders (Handycam Model DCR-DVD101). During the time when children viewed the commercials for both the persuasion understanding task and the advertising susceptibility task, the computer was placed directly in front of the child to help ensure that the child was able to view the show without distraction. If permission was provided to video record the child during assessments, a digital video camera and tripod were set up to record the child's viewing experience and to record responses for the test of emotion regulation.

In addition, two of the tests for executive function (inhibitory control and resistance to interference) relied upon reaction times from children. For these tests MediaLab and DirectRT were used (Jarvis, 2010a; Jarvis, 2010b) and were conducted on the same computers used for the video viewing segment of the study. MediaLab was used to format the questionnaire accompanying the tests while DirectRT was used to measure children's reaction time to the test stimulus.

Measures

Below is a listing of all measures implemented in this study separated by child and parent measures. Independent variables are presented first, followed by dependent variables and potential covariates. A table with all variables of interest including, means, standard deviations, and distributional characteristics/frequencies follows this section. Lastly, while all measures are presented within this section, not all measures were incorporated in the final analyses[3].

Child Measures

Independent Variables

Emotion Regulation

The child observation of emotion regulation was based on the disappointing gift task originally employed by Saarni (1984) and has since been widely used to assess children's emotion regulation capabilities (see Carlson & Wang, 2007, Garner & Power, 1996; Kieras, Tobin, Graziano, & Rothbart, 2005; McDowell, O'Neil & Parke, 2000; McDowell & Parke, 2005) as children's emotional reactions to the gifts have been shown

[3] These measures were included for additional studies not directly related to the matters under investigation for the current study.

to be consistently predictive of their emotion regulation skills. In the current study, the procedures were based on those used by Simonds et al, (2007). At the beginning of the first session, children were presented with an array of both age/gender appropriate and age inappropriate toys. The experimenter showed each toy to the target child and explained what each toy did. The child was then asked if they could tell the experimenter which two toys were the child's favorite and which one was their least favorite. The toys presented to each child were: a wind-up motorcycle, a sticky lizard, a stamp, a super popper (a piece of rubber that makes a popping sound), a putty animal, noise putty, notepad, and baby rattle. The child was given approximately two minutes to play with the toys and ask questions about each of the toys. The assessor then recorded the child's favorite, second favorite, and least favorite gifts.

At some point during the first assessment (typically during the child's executive function test), the assessor placed the toy selected as the child's most favorite in a gift bag and placed tissue over the toy. At the very end of the assessment, the assessor presented the child the gift bag and told the child that they could open the bag in the assessment room (children were told that they had to open it during the assessment because there were not enough gift bags for all of the children). While the child opened the gift bag, the assessor maintained complete silence and pretended to make notes of the data collection for approximately 15 seconds after the toy was given to the child. The child's reactions to the toy were videotaped.

At the end of the second data collection session, the child received another gift from the assessor and the same procedures noted with the first assessment were observed. However, this time the child 'mistakenly' received the toy that they reportedly liked least

of all. After the 15 second waiting period was over, the assessor told the child that there must have been a mistake and exchanged the undesirable toy with the child's second favorite toy. The child's reaction was recorded on videotape. Eight children did not have permission from their parents to videotape and one child's observation during the desired gift presentation was obscured and was unable to be coded.

Displays of emotion were coded by two raters for the time immediately following children's discovery of their particular gift (i.e., when it became apparent that the child knew what gift they had received). Coding of children's responses lasted either for the first 15 seconds after the child had seen the gift or when the experimenter first talked with the child after receiving the gift (whichever was shorter). After learning the code, the trained coders independently coded 20% of the sample to determine reliability (Cohen's kappa for each measure are noted below). After coder reliability was established, one coder coded the remaining videos. Children were scored along the following dimensions: the type of smile evidenced by the child (no smile, grin or forced smile, and broad smile), whether the child said 'thank you' after receiving the gift, whether the child said something positive about the gift, whether the child said something negative about the gift, and how much the child appeared to like the gift.

Broad smiles were defined as corners of the mouth clearly turned upward with the mouth opened while grin or forced smiles were defined as times when the corners of the mouth were turned upward but the child's mouth was not open (0 = no smile, 1 = grin or forced smile; 2 = full smile; first session M = 1.38, SD = 0.76; second session M = 0.81, SD = 0.74; $\kappa = .84$). A child was reported to have said thank you if the child explicitly expressed thanks for the gift by saying 'thank you' or 'thanks' (0 = no, 1 = yes; first

session M = 0.36, SD = 0.48; second session M = 0.19 SD = 0.40; κ = 1.00). A statement was scored as positive if the child declared that they liked/loved the toy or made a favorable comment about the toy (e.g., 'wow, this is really neat', 'this is just what I wanted'; 0 = no, 1 = yes; first session M = 0.32, SD = 0.47; second session M = 0.08, SD = 0.28; κ = .75). Statements that indicated dislike/hatred for the toy, sadness about receiving a toy or unfavorable comments about the toy (e.g., 'I don't want this') were scored as negative (0 = no, 1 = yes; first session M = 0.04, SD = 0.20; second session M = 0.23, SD = 0.43; κ = 1.00). Statements that indicated both like and dislike for the toy (e.g., 'I don't really like this toy, but thank you for giving it to me') were scored as both positive and negative. Lastly, children's liking of the gift was coded along a 5-point scale (1 = disliked very much; 5 = liked very much). For a child to receive a score of 1, they had to display extreme emotional negativity towards the gift (e.g., frowning, refusing to accept the gift) and/or say something very negative about the gift. Conversely, for a child to receive a score of 5, they had to display obvious elation over receiving the gift and/or provide statements suggesting that they liked the gift (first session M = 3.87, SD = 0.79; second session M = 2.47, SD = 1.19; κ = .91).

The first set of tests explored whether there were any differences in children's' reaction to the gift based on condition. Regarding children's reaction to the desired gift, there were no differences between the Froot Loops/D'animals and Trix/Splitz condition (smile code: $t(69) = 0.17$, $p = .87$; child said thank you: $\chi^2(1) = 0.45$, $p = .50$; child made positive comment: $\chi^2(1) = 0.45$, $p = .50$; child made negative comment: $\chi^2(1) = 0.29$, $p = .59$; child's observed liking of the gift: $t(69) = 0.99$, $p = .32$). In looking at the response for children's responses for the non-desired gift, there were no differences between

conditions (smile code: $t(70) = -0.44$, $p = .66$; child said thank you: $\chi^2(1) = 0.69$, $p = .41$; child made positive comment: $\chi^2(1) = 0.99$, $p = .32$; child made negative comment: $\chi^2(1) = 0.33$, $p = .59$; child's observed liking of the gift: $t(70) = 1.19$, $p = .24$).

Children's reactions to the varying gifts went as expected for each of the variables. Specifically, children were more likely to respond positively to the desired gift and more likely to respond negatively to the non-desired gift. With regard to smiling, when children received the desired gift they were significantly more likely to smile than when they received the disappointing gift, $t(70) = 4.97$, $p < .001$. Children were significantly more likely to say thank you when receiving the desired gift than when given the disappointing gift, $t(71) = 2.98$, $p < .01$. They were also more likely to say something positive about receiving the desired gift, $t(71) = 3.52$, $p < .01$, and were more likely to say something negative about the disappointing gift, $t(71) = -3.58$, $p < .01$. Lastly, children appeared to like receiving the desired gift more than the disappointing gift, $t(70) = 8.82$, $p < .001$.

For the purposes of hypothesis testing, the two separate measures of children's overall observed response to the desired gift and undesired gift were used. These measures were chosen because they were both correlated with other aspects of gift reception. With regard to children children's observed liking of the desired gift, their reactions were significantly correlated with each of the specific observations and all in the expected direction: how much the child smiled ($r(71) = .72$, $p < .001$), whether the child said thank you after receiving the gift ($r(71) = .23$, $p = .05$) whether the child made a positive comment about the gift ($r(71) = .53$, $p < .001$), and whether the child made a negative comment about the gift ($r(71) = -.23$, $p = .05$). The observed relationships

between how much the child responded to the undesired gift and the specific observations were also significant and in the expected direction: how much the child smiled ($r(72) = .49$, $p < .001$), whether the child said thank you ($r(72) = .25$, $p < .05$), whether the child made a positive comment ($r(72) = .60$, $p < .001$), and whether the child made a negative comment about the gift ($r(72) = -.56$, $p < .001$).

An additional set of tests were conducted to determine whether traditional developmental markers like age and language abilities were correlated with children's observed liking of both the desired and the undesired gift. There were no differences between older children and younger children for either gift (desired gift: $r(71) = .05$, $p = .71$; undesired gift: $r(71) = -.04$, $p = .73$) or for children who performed better on the measure of linguistic competence (desired gift: $r(72) = -.01$, $p = .93$; undesired gift: $r(72) = -.02$, $p = .85$).

Theory of Mind

A battery of four measures were administered to determine the child's level of social-cognitive and mental state understanding. Each of the following measures was adapted from earlier measures and has been used in previous research on theory of mind (see below). The number of tasks that the child successfully completed (out of the four) were used to create a score indicating theory of mind ability ($M = 2.25$, $SD = 0.98$). For all of these scenarios, children were presented with puppets that 'acted' out the scenarios along with laminated pictures to help the child understand the activities. When comparing overall performance on this measure, there were no differences in performance according to condition ($t(77) = 1.12$, $p = .27$).

First Order False Belief. The measure used in this study was originally created by Wellman and Liu (2004). The task was designed to test whether the child has a simple understanding of first-order false belief (i.e., that other people have thoughts different from their own). This particular measure presented a situation to children where two puppets are sharing a chocolate bar and both children put it in a cabinet to save the chocolate bar for later. After one puppet leaves, the other puppet takes the bar from the cabinet and puts it in the refrigerator. When the puppet that was not privy to the move re-enters, the child was asked where this character would look for the chocolate bar and where the chocolate bar really is. Children were considered to have attained first-order false belief understanding if they replied that the character will look in the cabinet and that the bar is really in the refrigerator (75% of children got this correct). There were no differences in children's performance on this test by condition ($\chi^2(1) = 0.20$, $p = .65$). Both child age and linguistic competence were significantly correlated with performance on this test (child age: $r(79) = .29$, $p < .01$; linguistic competence: $r(79) = .25$, $p < .05$), as older children and children with better language skills were more successful on this test.

Real-Apparent Emotion. This theory of mind measure was adapted from previous work by Wellman and Liu (2004). The task was designed to test whether the child understood that the words and facial affect someone uses does not always match up with the emotion that the person is feeling (i.e., the person says that they feel happy and are smiling but actually feels sad). Children were first presented with an answer sheet showing three cartoon faces that got progressively more positive in affect (sad, okay, and happy). Children were then told what each face meant (i.e., 'this face means happy') and were then asked to indicate which face they would point to if they felt happy, sad, or okay.

In the scenario, children were introduced to a puppet (Matt), whose face is never shown to the child. The assessor tells the child that the puppet had been picked on by other puppets and feels sad about it. However, rather than showing that being picked on has hurt his feelings, the puppet puts on a 'happy' face. Children were first asked questions about some specifics regarding the scenario. Specifically, children were asked what the other puppets did when the target puppet was getting picked on, and what these other puppets would do if they found out how the target felt. The child was then asked the target questions, first they were asked 'How did Matt really feel when the other children were picking on him' and was asked to respond by pointing to the appropriate face. Then, children were asked "How did Matt try to look on his face when the other children were picking on him" by pointing to one of the faces. Children who indicated that the puppet felt worse on the inside then what he showed on his face were considered to have successfully completed this task (87% completed this task correctly). There were no differences in children's performance on this test when looking at assignment to group A or group B ($\chi^2(1) = 0.002$, $p = .97$). Older children ($r(79) = .27$, $p < .05$) and children with better language skills ($r(79) = .30$, $p < .01$) performed significantly better on this test when compared to younger children, thus indicating that that performance on this task maps onto developmental changes.

Second Order False Belief. This measure was adapted from Perner and Wimmer (1985). Whereas the first order false belief tests whether children can consider someone else's mental representations, this measure tests the child's development of theory of mind by asking children to think about someone else's thoughts about *another* person's thoughts.

Children were shown two puppets (Bobby and Sally) and were told that the puppets both wanted to buy some ice cream from a truck that was stationed at a playground. One puppet (Sally) needs to go home to get money from her mother and tells the other puppet (Bobby) that she will meet him at the playground to get ice cream. However, when Sally gets home, her mother tells her that the ice cream truck is actually at the beach. In addition, Bobby finds out that the ice cream truck is also at the beach, and then heads to the beach to get his ice cream. Children are further told that Sally does not know that Bobby knows where the ice cream truck is. Children are then asked where Sally believes the ice cream truck is, where Bobby thinks the ice cream truck is, and where Sally believes that Bobby thinks the ice cream truck is. Children who answered all three questions correctly, were judged to have successfully completed the task (28% of children correctly completed this task). Children in the Froot Loops/D'animals condition were significantly more likely to successfully complete this task when compared to children in the Trix/Splitz condition ($\chi^2(1) = 3.76$, $p = .05$). Specifically, 37.5% of children in the Froot Loops/D'animals condition successfully completed this task compared to 17.9% of children in the Trix/Splitz condition. It is unclear why children in the Froot Loops/D'animals condition performed better on this test than children in the Trix/Splitz condition. As noted above, there was not a significant difference between conditions when looking at the four combined tests and the difference here may likely be due to chance. In addition, when looking at whether performance on this measure was linked to age and linguistic competence, they were not correlated (child age: $r(79) = .14$, $p = .21$; linguistic competence: $r(79) = .14$, $p = .24$).

Interpretive Theory of Mind. The last measure on theory of mind tests whether the child understands subtle elements of communication. Specifically, it tests whether children understand that what someone *says* is not necessarily what they meant. In the version used for this study (adapted from Fillipova & Astington, 2008), children were shown two puppets (Bobby and Matt) and a picture of a basketball court. The children were told that Matt is a new member of this school's basketball team and is very excited about being on the team. They are further told that his best friend Bobby is also on the team.

In the scenario, children are told that during Matt's first game, he has several easy shots, but misses them all. After the game, Bobby says to Matt; "You sure are a *great* scorer". Children are then asked two questions to assess their memory of the scenario "Did Matt help his team to win the game" and "What did Bobby say to Matt". They are then asked the target questions; the first target question was "does Bobby mean that?", the second question was "what does Bobby mean?", and finally "does Bobby think Matt is a great scorer?" One puppet is having a very hard time making shots and ends up missing the game winning shot. Another puppet who is playing basketball says to the puppet that keeps missing shots, "you are a *great* scorer". Children who correctly identify that the meaning of the statement was opposite from the literal interpretation were judged to have successfully completed the task (35% of children completed this task successfully). There were no differences in children's performance on this test by assignment to group A or group B ($\chi^2(1) = 0.76$, $p = .39$). When looking at how children performed on this task when compared to other developmental makers, older children ($r(79) = .25$, $p < .05$) and children with better language skills ($r(79) = .22$, $p < .06$) were more likely to successfully complete the task.

Cognitive vs. Communicative Theory of Mind

An additional measure was created based on children's separate responses to the cognitively based theory of mind tasks and the communicative theory of mind tasks as these tasks appeared to capture two separate aspects of social cognitive understanding that could differentially influence persuasion and selling understanding. The two false beliefs tasks do not require that children be able to unmask what someone is saying compared to what they actually mean, while the real-apparent task and interpretive theory of mind task both require children to be able to discern what someone is 'really' saying. As such, the two false belief tasks do not require communicative insight to successfully complete versus the two other theory of mind tasks that do rely on some interpretive element of communicative skill (e.g., detecting sarcasm). Performance on the two false belief measures (first order false belief, second order false belief) were combined for use as a measure of cognitive theory of mind ($M = 1.03$, $SD = 0.64$) while the results from two other theory of mind tasks (real-apparent, interpretive theory of mind) were combined as a measure of communicative theory of mind ($M = 1.23$, $SD = 0.60$). The following table shows how the individual tasks were correlated with each separate measure along with the two indices. The results show that none of the individual measures were correlated, but that the indices did differentiate the separate concepts relating to theory of mind.

Tests were conducted to determine whether children's performance on these measures varied by condition. There were no differences (cognitive theory of mind: $t(77) = 0.71$, $p = .48$; communicative theory of mind: $t(77) = 1.05$, $p = 0.30$). Lastly, older

Table 1. *Zero Order Correlations for Individual Theory of Mind Tasks and Indices*

	2	3.	4.	5.	6.
1. First Order False Belief	.22	.04	.13	.22*	.71***
2. Real Apparent		.07	.04	.59***	.20
3. Second Order False Belief			.13	.14	.73***
4. Interpretive ToM				.83***	.18
5. Communicative ToM					.25*
6. Cognitive ToM					

Note: ToM = Theory of Mind; * $p < .05$, *** $p < .001$

children and children with better language skills performed better on these tasks when compared to younger children and children with less developed language skill (cognitive theory of mind- child age: $r(79) = .30$, $p < .01$; linguistic competence: $r(79) = .27$, $p < .05$; communicative theory of mind- child age: $r(79) = .35$, $p < .01$; linguistic competence: $r(79) = .34$ $p < .01$).

Executive Function

Three tests of executive function were administered to children[4]. These tests were designed to assess varying aspects of executive function: inhibitory control, resistance to interference and working memory. The tests of inhibitory control and resistance to interference relied upon measures of reaction time and were administered via computer using DirectRT and MediaLab (Jarvis, 2010a, Jarvis, 2010b). In addition, in order to

[4] The original plan was to also assess 'hot' executive function via the Hungry Donkey Test (Crone & van der Molen, 2004). However, the measure was removed from assessments due to the length of time it took to administer and child complaints about the task.

understand children's baseline reaction time, an additional test of reaction time was administered which was designed to assess how quickly children could press a button on the keyboard.

Square Test. This test was administered as a pure test of children's reaction time. Before beginning the test, children were told that the game was designed to see how fast their reactions were to the things they see on screen. They were then told that whenever they saw a square on screen they needed to press the computer's spacebar as fast as possible. After it was clear that the child understood how the game was supposed to be played, a practice round was initiated. The practice round consisted of eight trials with single blue squares appearing in eight randomly selected locations on the screen with the trials randomly spaced between 1000ms to 2000ms[5]. After completing the practice round, children were given the opportunity to complete the practice round again if it was apparent that they did not understand how the game was played, although none of the participants in the study volunteered or were encouraged to redo the practice round.

After completing the practice round, children moved to the primary test of reaction time. The primary test was similar to the practice round, except this round consisted of twenty trials instead of eight. After eliminating responses in excess of 1500ms, the raw baseline score (in milliseconds) for reaction time was calculated by taking the average reaction time over the completed trials (M = 414.15, SD = 80.24). An additional score of child reaction time was calculated by taking out extreme values (i.e.,

[5] A note of clarification, the times between trials were randomly assigned during creation of the reaction time tasks rather than assigned during each child's test. In other words, the random distribution of trials was consistent across children and not between children. The time between trials was randomly spaced to guard against participant 'guessing'.

values which exceeded 2 standard deviations; Ratcliff, 1993) to guard against those instances when children were distracted or made mistakes (e.g., pressing the wrong button on the computer; M = 394.90, SD = 74.52). Based on previous research, another measure was created with children's reaction time data; this was a measure of reaction time variability, which has been linked to performance on inhibitory control tasks (Epstein et al., 2011). The measure of reaction time variability was based on the trials that were less than 2 standard deviations from the mean and was transformed using a square root transformation in order to approximate a normal distribution (M = 8.19, SD = 1.97).

Independent samples t-tests were conducted to determine whether children performed differently on this measure. The results indicated that there were no significant differences between groups (average reaction time: $t(76) = 0.71$, $p = .48$; average reaction time with extreme values removed: $t(76) = 0.83$, $p = .41$; transformed standard deviation with extreme values removed: $t(76) = 1.33$, $p = .19$). Younger children performed significantly worse on these measures of reaction time compared to older children (average reaction time: $r(79) = -.33$, $p < .01$; average reaction with extremes removed: $r(79) = -.32$, $p < .01$; transformed standard deviation with extreme values removed: $r(79) = -.22$, $p = .05$) and children with lower linguistic competence performed marginally worse than children with better language skills (average reaction time: $r(79) = -.21$, $p < .07$; average reaction with extremes removed: $r(79) = -.22$, $p < .06$; transformed standard deviation with extreme values removed: $r(79) = -.14$, $p = .21$).

Go-No-Go Task. This executive function measure tested how well the child did on tasks demanding inhibitory control (Casey et. al., 1997). The Go-No-Go task is a widely used test of inhibitory control for assessing executive functioning (e.g., Bunge et al., 2002;

Kim et al., 2007; Meristo & Hjelmquist, 2009), attention deficit disorder (e.g., Kaufmann et al., 2010; Trommer, Hoeppner, Lorber & Armstrong, 1988) and neurological functioning (e.g., Bunge et al., 2002, Rubia et al., 2001) across ages, including the age range for the current study (e.g., Hirschtritt et al., 2009; Meristo & Hjelmquist, 2009). The purpose of this test is to see how well children can inhibit their pre-potent response to perform a given act. During the task, the child is told to press a button as fast as they can if a condition is met while inhibiting a response if a separate condition is met.

In this case, children were told they were going to play a game called "Leprechauns and Trolls" and that they are supposed to capture as many leprechauns as possible while avoiding trolls (they accomplished this by pressing, or not pressing, the computer's space bar). In order to encourage the quickest responses possible from children, they were told that the leprechauns would disappear quickly if they do not press the button as fast as possible.

Figure 3: *Stimuli Used for Go/No-Go Task*

Similar to the Square Test, children were given the opportunity to complete a practice round, with the option to continue with additional practice rounds if necessary (two children opted to repeat the practice round). Also similar to the Square Test, the time between trials was randomly spaced between 1000ms to 2000ms. The images appeared on screen for a maximum of 2000ms and disappeared if the child pressed the space bar or if the time elapsed. The primary test included forty trials with half of the trials featuring a picture of a leprechaun while the other half featured an image of a troll. Three measures were used to capture children's performance on the Go-No-Go task, the number of commission errors made by the child (i.e,. trials in which the child mistakenly caught a troll; $M = 1.66$, $SD = 2.54$), average reaction time on correct leprechaun trials (due to normality issues, values were transformed using a square root transformation; $M = 26.06$, $SD = 2.84$), and the standard deviation across all correct leprechaun trials (transformed using square root transformation; $M = 13.08$, $SD = 2.60$).

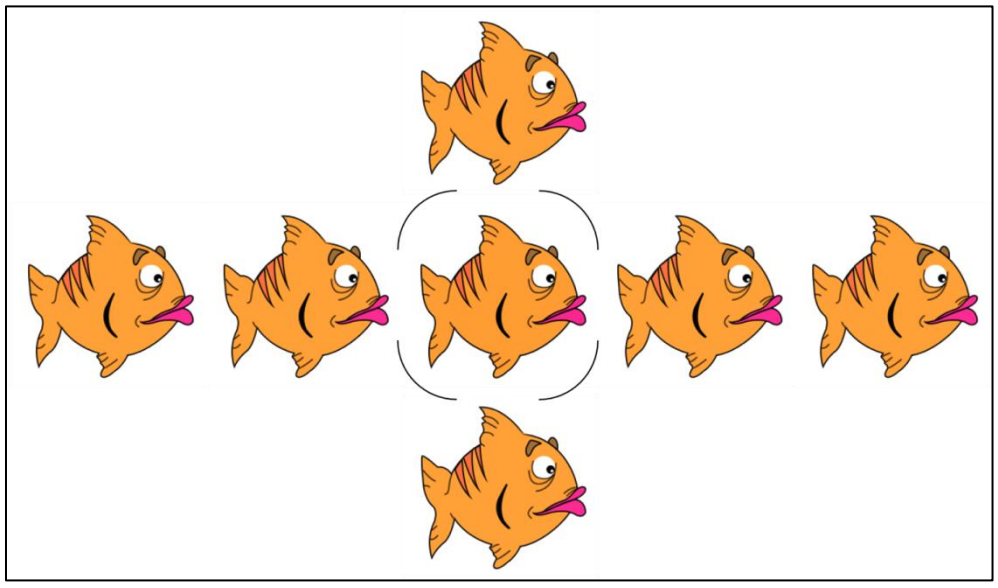
Tests to determine whether children were performed differently based on condition revealed no significant differences between groups (mistakes made: $t(77) = 0.95$, $p = .35$; transformed reaction time: $t(77) = 0.99$, $p = .33$; transformed standard deviation: $t(77) = 0.91$, $p = .36$). An additional set of tests were conducted to determine whether children's performance on these measures was linked to either age or linguistic competence. The results indicate that of these measures, only average reaction time during correct trials (i.e., trials where children caught leprechauns) was significantly correlated with age and language abilities (child age: $r(79) = -.30$, $p < .01$; linguistic competence: $r(79) = -.27$, $p < .05$) while the other two measures were not (mistakes made- child age: $r(79) = -.06$, $p = .61$; linguistic competence: $r(79) = -.09$, $p = .45$;

transformed standard deviation- child age: r(79) = -.10, p = .40; linguistic competence: r(79) = -.12, p = .30).

Flanker Test. This executive function measure tests how well the child does with interference (Ridderinkhof & van der Molen, 1995; Reuda et. al., 2004, Stins et al., 2004; von Geusau et al., 2004). Specifically, this test seeks to determine how quickly a child can accurately finish a task, while having to contend with competing stimuli and was adapted from Simonds et al. (2007).

For this task, the participants were asked to indicate which direction a stimuli in the center of the screen was pointing by using two selected keys on the computer keyboard. In this case, the stimuli were cartoon fish and children were told that they

Figure 4: *Example of Stimuli Used for Flanker Test*



needed to indicate which direction the target fish was swimming (the target fish was surrounded by a box to ensure that children were not confused; see Figure 4). The target fish was presented with other fish that were either swimming the same way (non-interference) or the opposite way (interference), with the interference stimuli producing

longer reaction times and more mistakes, particularly with children that have less mature executive function (see Simonds et al., 2007).

Before starting the task, children were given instructions by the assessor about how the game was played and what keyboard buttons they should use. Once it was clear that the child knew how to play the game, they moved to the initial practice round. This round consisted of eight trials with the trials randomly spaced at 1000ms to 2000ms (see above), and only featured one fish. The reason for including only one fish in this practice round was to make sure that children understood the fundamentals of the game. After completing this initial practice round, children were given an opportunity to repeat the practice round (none of the participating children requested to repeat the practice). The child then moved on to an additional practice round, this practice round also featured eight trials with the same spacing between trials noted above. However, this practice round included the interference (or non-interference) stimuli. After finishing the second practice round, children were given the opportunity to repeat the round if the child requested it (no children asked to repeat the practice around).

The primary test included 48 trials, with 24 interference trials and 24 non-interference trials. Half of these trials featured the target fish swimming to the left and the other half featured target fish swimming to the right. Lastly, all trials were evenly split up with 16 trials featuring two fish, 16 trials featuring four fish, and 16 trials featuring six fish. All trials exceeding 3000ms were removed from analysis. Two measures were used to capture children's performance on the Flanker task, the number of total errors ($M = 2.15$, $SD = 3.73$) and average reaction time to the interference trials minus the average reaction time to the non-interference trials ($M = 36.79$, $SD = 98.43$). An additional score

of reaction time differences was calculated by taking out extreme values (i.e., values that exceeded 2 standard deviations of the mean) to guard against those instances when children were distracted or made mistakes (M = 54.67, SD = 96.90).

There were no observed differences between children exposed to the group A advertisements and children exposed to the group B advertisements (errors made: $t(77) = -0.42$, $p = 0.67$; incongruent-congruent difference: $t(77) = 0.18$, $p = 0.86$; incongruent-congruent differences extremes removed: $t(77) = -0.34$, $p = .73$). A test of differences between younger and older children indicated that younger children made more mistakes on this task ($r(79) = -.29$, $p < .05$). Otherwise, there were no differences between younger children and older children on this task. In addition, there were no differences on any measures between children who scored higher on the language measure and children who score lower on this measure.

Working Memory. The last test of executive function related skills was a test of working memory. The task used for this study was the backward digit span test, which is a commonly used test of working memory (Baddeley, 2000). At the start of the task, children were told that they would be playing another game that was designed to see how good their memory was. Children were then told that they would be asked to remember an array of numbers, that the numbers would only be read once, and that they would need to read the numbers backwards to the assessor. Assessors were instructed to read the numbers to the children at a pace of one digit per second (see Lieberman, 2007). The child was provided with two examples of how the test was supposed to proceed, with a two-digit example and a three-digit example. After it was clear that the child understood the test, two practice examples were administered (another two-digit and three-digit

example) which gave children an opportunity to demonstrate that they fully understood the task.

Once the child completed to practice items, the main part of the test began. The test was comprised of eight rounds with two trials in each round. In addition, the number of digits for each round increased by one digit in successive rounds. All children began with the 2-digit round and continued to the 3-digit round, if they got at least one of the 2-digit items correct. The test progressed until children got both items wrong in a given round or finished all rounds of the test (none of the participating children reached the last round). Scores for children's performance on this task were calculated in two ways, the first measure simply featured a count of how many items the child correctly answered ($M = 4.33$, $SD = 1.69$), and the second was calculated by taking the items the child correctly answered and weighting it by the number of digits remembered for that specific item (e.g., if the child got both 2-digit items, one 3-digit item and one 4-digit item correct, the child's score was 11 [2 + 2 + 3 + 4]; $M = 12.35$, $SD = 6.72$; Sandoval, Ruef, & Alvarado, 2001).

There were no differences between children in group A and group B on performance for either the number correct ($t(77) = 1.45$, $p = .15$) or adjusted score ($t(77) = 1.34$, $p = .18$), although the results do suggest a trend, such that children in the Froot Loops/D'animals condition performed better on these measures than children in the Trix/Splitz condition did. When looking at differences along age and linguistic competence, there were significant differences in performance on this test for age and language abilities indicating that success on this task is linked to development (number correct- child age: $r(79) = .29$, $p < .05$; linguistic competence: $r(79) = .31$, $p < .01$;

adjusted score- child age: $r(79) = .32$, $p < .01$; linguistic competence- $r(79) = .29$, $p < .05$).

Test Errors. An additional measure was created based on the errors children made across all of the executive function tasks. This measure incorporated commission errors on the Go-No-Go task (i.e., those times when the child 'caught' trolls), errors on the Flanker task, and incorrect trials on the working memory task. The percent of errors made for each task were summed. However, due to significant issues related to the non-normal distribution of scores, an index was created whereby children were grouped into one of five categories based on the number of total errors made (0 = *fewest errors made*, 4 = *most errors made*; M = 2.01, SD = 1.43). There were no differences in errors made across advertisement viewing conditions, $t(77) = -0.39$, $p = 0.70$. An examination of how children performed along the these executive function measures revealed that younger children made more overall errors on these tasks, $r(79) = -.36$, $p < .01$ and children who performed worse on the linguistic competence task made more mistakes $r(79) = -.27$, $p < .05$.

Dependent Variables

Advertising Knowledge

The measure for advertising knowledge was adapted from two previous measures (Chernin, 2007; Rozendaal, Buijzen & Valkenburg, 2010). The goal of this measure was to determine what the children understood about advertisements, whether they understood their selling intent (i.e., commercials try to get you to buy things) and their persuasive intent (i.e., commercials try to get you to like the product; see Kunkel, 2010).

The measure employed two differing methodologies to determine children's advertising knowledge.

First, from Chernin's measure (2007), children were asked open-ended questions about commercials, without the benefit of viewing an advertisement. Specifically, children were asked (in order), "What is a commercial?", "Why are commercials shown on television?", and "What do commercials try to do?" Responses to these open-ended questions were recorded by the assessors and then later coded to assess whether the child understood the purpose behind advertisements (see below for discussion of coding reliability).

However, contrary to the procedure used by Chernin, the current study employed the methodology used by Rozendaal et al (2010). Specifically, as argued by Kunkel (2010), knowing that an advertisement is designed to encourage you to want to purchase the product is distinctly separate from knowing that an advertisement is designed to make you like the product. With the former theorized to occur before the latter. As such, children's responses were analyzed for children's knowledge of persuasive intent and knowledge of selling intent. Knowledge of persuasive intent was defined as knowledge of the fact that commercials try to convince people to like the things that are being advertised (e.g., 'commercials try to make you think something is really cool') and knowledge of selling intent was defined as knowledge of the fact that commercials try to make people buy the things being advertised (e.g., 'commercials try to make you go to the store and buy it'). Children's responses to this series of questions were analyzed to establish the presence (or absence) of knowledge of persuasive/selling intent and the child's ability to articulate his/her comprehension of each concept.

The second part of this measure also followed the procedure established by Chernin (2007), as children were shown three commercials and were asked about each message's intent. Children were seated at the computer with the assessor, while the assessor explained that the child was going to watch some commercials and that the assessor just wanted to know what the child thought about them. The commercials chosen for this part of the assessment were taken from the same pool of advertisements that were used to select the advertisements testing persuasion susceptibility. Great care was taken to select advertisements that matched the types of messages that children were most likely to see during children's programming (e.g., the presence of exciting formal features and the use of attractive characters) and appealed to a wide audience (i.e., did not target one gender over another, products were designed for use with children in the target age group). The three advertisements shown to children were a 30-second advertisement for Paper Jamz (a computerized pad that children can play as a drum), a 30-second advertisement for Honey Nut Cheerios (a sugary cereal), and a 30-second advertisement for Hex Bug Ants (a small robot which mimics a bug).

Similar to the procedure noted above where two separate types of advertising knowledge were assessed, after viewing each of these commercials, children were asked two questions, one to assess their understanding of selling intent and the other to assess their understanding of persuasive intent. The selling intent question was "Does this commercial want people to buy *product name*?" The persuasive intent question was "Does this commercial want people to like *product name*?" For scoring this measure, only answers that were unambiguously in the affirmative where scored as correct. For

example, if a child indicated that a commercial 'kind of' wanted people to buy the product, the child was reported to not understand the selling intent of the commercial.

The responses to the open-ended questions were coded to determine if the child had correctly responded to the question. However, rather than using individually coded responses as separate indicators for reliability, the total scores for both knowledge of selling intent and knowledge of persuasive intent were used to assess reliability. Two trained coders jointly scored 19% (n = 15) of responses for both measures and were able to attain reliability for both knowledge of persuasive intent ($\kappa = .86$) and knowledge of selling intent ($\kappa = .91$). Children's performance on the open-ended questions were then combined with their responses to the direct questions to create an index of advertising knowledge with one score for knowledge of persuasive intent and another for knowledge of selling intent. For example, children who correctly answered each question for knowledge of selling intent received a score of six (knowledge of persuasive intent: M = 2.86, SD = 0.97; knowledge of persuasive intent: M = 3.38, SD = 1.17) There were no differences between conditions for children's performance on the measure of selling intent ($t(77) = 1.10$, $p = .27$) and knowledge of persuasive intent ($t(77) = -0.55$, $p = .58$).

Product Reception Variables

The following section describes the variables used to test children's reactions to the consumer goods used for the study. For each of the variables testing children's reaction to the stimulus advertisements: child reported purchase requests after advertising exposure, amount of cereal eaten, cereal selected during advertising exposure, and cereal/snack choice after exposure, the value reported reflects children's responses to the products they were exposed to during the viewing session relative to the products they

were not exposed. For example, for the measure of cereal eaten after exposure, children in the Froot Loops/Danimals exposure group, their score represents the amount of Froot Loops eaten over Trix while children in the Trix/Yoplait Splitz exposure group, their score represents the amount of Trix eaten over Froot Loops. Consequently, these values represent children's persuadability or reception independent of product.

Product Liking and Purchase Desire

During both assessments, children were asked about each of the four products (see above for a description of the products used). For each of the products, the assessor presented children with an 8.5" x 11" laminated high-resolution picture of the product. They then asked the child if they knew what the product was and if they knew the product name. The child was then asked if they liked the product using a scale from 1 to 5, with 1 represented by a NO!, 2 represented by no, 3 represented by don't know/don't care, 4 represented by yes and 5 represented by YES! (Chernin, 2007; children were instructed on the use of the scale during both assessments). Using the same scale, the child was then asked if they would like his/her parents to purchase the product (if the child reported that they already owned the product, they were asked how much they like it when their parents purchase the product for them).

In looking at differences in liking and purchase desire during the first assessment for both the cereals and snacks, there was one significant difference. Children liked D'animals more than Splitz during the first assessment ($t(78) = 2.18$, $p < .05$; D'animals $M = 0.89$, $SD = 1.35$; Splitz $M = 0.49$, $SD = 1.31$). There were no differences for purchase desire for the snack and there were no differences for liking or purchase desire for the cereals. With regard to the differences for both liking and purchase desire during

the second assessment, there were no significant differences for either the snacks or the cereal.

The next test investigated whether there were any differences for liking or purchase requests across condition. There was only one marginally significant difference when comparing children's responses to the product at both pre and post-test. At pre-test, children in the D'animals condition stated that they liked this product less ($M = 0.70$, $SD = 1.40$) than children in the Splitz condition ($M = 1.15$, $SD = 1.18$), $t(77) = -1.77$, $p < .09$. There were no other differences between children's liking and purchase desire across conditions for any of the products.

An additional set of variables of interest were constructed based on the differences in liking and purchase requests between pre-test and post-test. These variables were calculated by taking the liking or purchase requests from post-test and subtracting the respective measure from pre-test (liking: Froot Loops, $M = 0.28$, $SD = 1.20$; Trix, $M = 0.32$, $SD = 1.55$; D'animals, $M = -0.10$, $SD = 1.26$; Splitz, $M = 0.04$, $SD = 0.98$; purchase desire: Froot Loops, $M = 0.09$, $SD = 1.30$; Trix, $M = 0.15$, $SD = 1.41$; D'animals, $M = -0.16$, $SD = 1.32$; Splitz, $M = -0.08$, $SD = 1.02$). Overall, there were no differences for the change scores for either cereals or snacks according to liking or purchase desire, indicating that exposure to the different groups of advertisements did not sufficiently persuade children (this is discussed in greater detail below). The next step was to determine if there were any significant differences between conditions on change scores for both the cereals and snacks. In general, children seemed to react more favorably to the cereals that they were exposed to from pre-test to post-test and appeared to increase their liking and purchase desire. Conversely, when looking at the change

scores for the snacks, children seemed to react more favorably to the products they were exposed to (with the exception of liking for Splitz where children in the D'animals condition liked this product more than children in the Splitz condition) but children's liking and purchase requests at post-test appeared to decrease from pre-test in six out of the eight measures. However, when looking at statistical differences between products and condition, the tests revealed only one marginal difference between conditions as children assigned to view the Trix advertisement (M = 0.54, SD = 1.23) increased their liking of Froot Loops more than children assigned to only view the Froot Loops commercial (M = 0.03, SD = 1.12) did, $t(77) = -1.94$, $p < .06$. For hypothesis testing, the measures of liking and purchase desire were combined across conditions for both the overall liking and purchase desire measure and the change scores for liking and purchase desire.

Table 2. *Products Chosen by Condition at Post-test*

	Cereal % (N)			Snack % (N)		
Condition	Froot Loops	Neither	Trix	D'animals Coolision	Neither	Yoplait Splitz
Froot Loops/D'animals Coolision	45% (18)	0% (0)	55% (22)	58% (23)	0% (0)	43% (17)
Trix/Yoplait Splitz	33% (13)	0% (0)	67% (26)	41% (16)	5% (2)	54% (21)

In order to test hypothesis 3b, which looked at differences in children's purchase desire according to their executive function whereby children with more executive function skills would be less likely to want to purchase the products, children's responses for purchase desire for all products were combined (M = 3.38, SD = 3.38).

Product Choice

Following the measure of purchase desire and product liking, children were presented with another laminated picture combining the two products in the same product class (i.e., Trix vs. Froot Loops; D'animals Coolision vs. Y'oplait Splitz). Children were then asked:" if they could only have one of these products, which one would they pick?" If children indicated that they would like both equally, they were prompted to only pick one. However, if the child stated that they *did not* want either product, they could select 'Neither'. For those children who declined to select a product, their response was recoded as having not selected the experimental stimuli (two children in both the first and two children in the second assessment declined to choose a snack). Table 2 shows how often children selected the targeted products at post-test.

Cereal selection. In looking at differences for the selection of cereal during both the first and second assessment, children were not more likely to select one cereal over the other before exposure to the specific cereal advertisements, $t(78) = 1.01$, $p = .31$. During the second assessment it was expected that children would be more likely to choose the product that corresponded to the advertisement that they had just seen (i.e., children exposed to the Trix advertisement would select Trix, children exposed to the Froot Loops advertisement would select Froot Loops). The results did indicate that children were marginally more likely to select one cereal over the other, $t(78) = 1.95$, $p = .06$. Trix

cereal was the obvious favorite with children in the second assessment choosing it 61% of the time versus 39% of children choosing Froot Loops. When looking at this difference by assignment to commercial viewing, it is clear that viewing the Trix commercial had its desired effect as 67% of children exposed to the advertisement selected the cereal at post-test. However, the results also show that children who had viewed the Froot Loops advertisement were more likely to select Trix at post-test with 55% of children exposed to the Froot Loops advertisement saying they wanted Trix. Consequently, while the Trix advertisement did appear to influence children's consumer behavior more so than the Froot Loops advertisement, it is also clear that children just seemed to like Trix cereal more (likely because of their experience tasting the product during the viewing session).

Snack selection. Similar to the results for cereal selection at pre-test, children were not more likely to select one snack over the other during the first assessment, $t(78) = -.57$, $p = .57$. However, after exposure to the snack advertisements, it was expected that children would be more likely to select the snack that they had just seen advertised. This did not occur as children were not significantly more likely to select the snack that they had seen advertised, $t(78) = 0.32$, $p = .75$. As seen in Table 2, a look at children's selections when compared by condition suggests that children were somewhat more likely to select the snack that they were exposed to but the differences were slight (54% of children in the Splitz condition chose that snack, 56% of children in the D'animals condition chose that snack).

In order to create an index of product selection, results from the cereal selection and snack selection were combined. Children who selected the cereal that was advertised to

them while watching the *SpongeBob SquarePants* episode were given a score of 1 (i.e., children who saw the commercial for Trix and selected Trix), while children who did not were given a score of 0 (i.e., children who saw the commercial for Trix and selected Froot Loops). The same scoring procedure was used for snack selection with the results combined (M = 1.11, SD = 0.75).

Product Consumption

Two measures of cereal consumption were used for the study. The first was based on the amount of cereal that the child ate during the viewing period and the second was based on which cereal the child ate first after viewing each cereal advertisement. With regard to the first measure of cereal consumption, children were initially given one 30g serving of each cereal at the start of the viewing session. Children were instructed that they could eat as much cereal as they like, but they could not combine the cereals in one bowl. If a child finished one of the bowls of cereal, they were immediately given an open single serving container of the same cereal. At the end of the viewing session, the cereal containers were taken by the assessor and weighed[6] (see Table 3 for amount of cereal eaten by condition). The measure of cereal consumption was created by subtracting the amount of cereal eaten for the unadvertised product from the amount eaten for the advertised cereal at the end of watching the *SpongeBob SquarePants* episode (M = 0.15, SD = 18.23). Children did not eat more of one cereal over the other (t(78) = -0.59, p = 0.55). Furthermore, there were no differences in amount of cereal eaten based on whether children were in the Trix or Froot Loops condition, $t(77) = -0.59$, $p = .56$.

[6] The lids for the cereal were included in the measurement of the cereal weight at the beginning of the assessment, but were not included in the later measurements.

Table 3. *Amount of Cereal Eaten in Grams by Condition*

Condition	Froot Loops M (SD)	Trix M (SD)
Froot Loops/D'animals Coolision	15.20 (12.05)	16.25 (12.97)
Trix/Yoplait Splitz	16.13 (11.70)	17.51 (14.62)

The second measure of product consumption explored which cereal the child ate immediately after viewing both cereal advertisements. Specifically, assessors observed which cereal the child ate from at the start of the 'product shot' (the part of children's cereal advertisements where a bowl of the cereal is prominently featured and the announcer states that the cereal is 'part of a nutritionally balanced breakfast'); the 'product shot' in both commercials were visually similar and were shown at approximately the same time in both advertisements. The rationale for using this as the demarcation for when the child reached for the cereal, rather than the very beginning of the advertisement, was because it was only at this point that the names for both cereals were clearly stated in the advertisements. The assessor then watched for which cereal the child reached for until approximately 10 seconds after the advertisement aired. If the child did not reach for a cereal within this period, the assessor indicated 'neither'.

The primary measure was how often the child ate from the advertised cereal after watching both of the cereal advertisements (M = 1.11, SD = 0.86; 31.6% of children did not eat from the advertised cereal after the commercial, 25.3% ate from the advertised cereal once, and 43% of children ate the advertised cereal after both commercial airings).

There were no differences in the cereal eaten based on the experimental condition ($t(77) = -0.66$, $p = .51$).

Test of verbal ability

Because children's ability to understand persuasion has previously been linked to their verbal abilities (Chernin, 2007), a measure of children vocabulary was included in the study. Children's verbal ability was tested with one of the subtests from the Woodcock-Muñoz Language Survey–Revised (WMLS-R; Woodcock, Munoz-Sandoval, Ruef & Alvarado, 2001). The specific subtest used was the Picture Vocabulary Test. Children were presented with a page of pictures and were asked to provide the word that matched the picture. Children were given a score of 0 for incorrect identification and a score of 1 for correct identification. The test was administered by using the grade level guideline set by the creators of the test, which instructed what page of the test the child should start on. Basal was established by finding the lowest page of the test whereby children got every item right on the page. For example, if a child got one item wrong on his/her starting page, the child was asked to complete the preceding page until they were able to get all items correct on one page. Once basal was established, children moved through more pages of pictures that are designed to get progressively more difficult as the test continues. The test ended when either the last page of the test was reached or when children reached a page where they were not able to identify any of the pictures correctly. The child's score on this test was calculated by taking the number of items that children answered correctly and the number of test items present before the child's basal was established ($M = 34.80$, $SD = 3.68$). There were no differences in linguistic competence between conditions, $t(77) = 0.01$, $p = 1.00$.

Parent Measures

Demographics

Parents were asked about certain demographic indicators for use in the analyses. The selected variables were the child's age, the child's race, the parent's race, number of children and adults in the house, family income, parent education, languages spoken in the home (including the language that child speaks most, the language the child prefers to speak in the home), child/parent ethnicity, parent employment and whether the child qualifies for free/reduced lunch. Appendix B shows the means/percentages for each of the demographic variables.

Media Use and Access

Parents were asked about their child's media use and the child's access to media in their bedroom or in the home. Specifically, parents were asked about the amount of television that the child watches on the typical weekday and weekend, children's bedroom media, and how often the television is on in the home.

Children's television exposure was obtained by asking parents how many weekdays/weekend days per week the child watches television along with the average number of minutes that children watches on those days. Television exposure was calculated by multiplying the number of weekdays that children watched by the average amount of minutes parents reported their children watching and then summing this total with the number of weekend days that children watched multiplied by the average weekend minutes viewed ($M = 72.94$, $SD = 39.5$).

Children's bedroom television ownership was obtained by asking parents if their child had a television in their bedroom (43.8% of children had a television in the bedroom).

Lastly, parents were asked how often the television was on in the home, even when no one is watching it. The response options were (0 = Do not own a television/Never to 4 = Almost always; M = 2.02; SD = 1.15).

Behavior Rating Inventory of Executive Function (BRIEF)

The BRIEF is a nationally validated measure of executive function and is widely used to assess children's executive function via parent report and is used to diagnose children and adolescents with attention disorders (Gioia, Isquith, Guy & Kenworthy, 2000; Gioia, Isquith, Retzlaff, & Espy, 2002; Mahone et al., 2002; Mangeot, et al, 2002; McCandless & Laughlin, 2007; Toplack, Bucciarelli, Jain, & Tannock, 2008). Parents answered questions about their child's behavior over the last six months using three sub-scales from the measure: Inhibition Control, Working Memory and Attentional Shifting. The response options for all items in the scale were the same (0 = Never to 2 = Often) with scales calculated by taking the sum of responses. Higher scores on each of these measures indicate more difficulty with executive function.

The measure of inhibitory control was a 10-item measure and featured questions such as: "how often does your child blurt things out" and "how often does your child need help to stay on task". The measure of inhibitory control had very good reliability ($\alpha = .90$; M = 6.87, SD = 4.32).

The parent measure of children's working memory was a 10-item measure and featured questions, such as "how often does your child have trouble with chores or tasks that have more than one step" and "how often has your child have a short attention span". The measure of working memory had very good reliability ($\alpha = .91$; M = 6.51, SD = 4.75).

The last scale from the BRIEF measured attentional shifting and was an 8-item measure that features questions, such as "how often has your child become upset with change of plans" and "how often has your child become upset with new situations?" This measure of attentional flexibility had adequate reliability ($\alpha = .81$; $M = 4.51$, $SD = 3.07$).

For the purposes of hypothesis testing, the three scales were combined to form one measure of children's executive functioning and had very good internal reliability ($\alpha = .92$). Due to a non-normal distribution, the measure was transformed using a square-root transformation ($M = 4.06$, $SD = 1.20$) with higher scores indicating less developed executive function. There were no parent-reported differences between conditions on performance of this measure, $t(77) = -0.63$, $p = .53$. When looking at children's performance on this measure along both age and linguistic competence, there were no differences between older and younger children ($r(79) = .05$, $p = .66$) or between children with higher scores on the language measure and children who did not perform as well ($r(79) = -.08$, $p = .50$).

Emotion Regulation

The child's emotion regulation skills were assessed with two separate parent report measures. These two measures assess separate aspects of emotion regulation the first measure (the Emotion Regulation Checklist) looks at both positive and negative emotion regulation while the second measure (Positively Valenced Emotion Regulation) only explores how children handle very positive emotions. For the purposes of hypothesis testing, both scales were used.

Emotion Regulation Checklist (ERC). This 23-item parent report measure has 2-sub scales and was designed to assess the child's emotional lability and emotion regulation

skills (Shields & Cicchetti, 1997). Past research using the ERC has shown this measure to be a valid indicator of children's emotional regulation with good to excellent reliability (Fantuzzo, Bulotskyshearer, Fusco, & Mcwayne, 2005; Shields & Cicchetti, 1997; Shields et al., 2001). All items were measured on a 4-point scale (0- 'Never'; 3- 'Almost always').

The emotional regulation scale consists of 8-items and asked about the child's ability to control emotional impulses. The scale included questions such as 'My child is a cheerful child', 'My child responds positively when other children approach my child', and 'My child responds positively when adults approach him/her in a friendly or neutral way'. The scale demonstrated adequate internal consistency ($\alpha = .70$) and was transformed using a squared transformation due to issues of normality, $M = 371.84$, $SD = 105.68$ with higher scores indicating better emotional control. I then tested whether there were any differences between conditions on this measure, there were no significant differences between children assigned to watch group A advertisements and group B advertisements, $t(77) = 1.12$, $p = .27$.

The questions assessing the child's emotional lability/negativity were assessed via a 15-item subscale. The scale included questions such as 'My child has wild mood swings' and 'My child moves easily from one activity to another; doesn't become angry, anxious, upset, or overly excited when changing activities'. The scale demonstrated good reliability ($\alpha = .87$) and the measure was transformed due to a non-normal distribution, $M = 3.18$, $SD = 0.92$. The test of differences between conditions did not reveal a significant difference, $t(77) = -0.35$, $p = .73$.

Both scales were tested against age and linguistic competence to determine whether parent ratings followed developmental changes in the child. Neither age nor linguistic competence were correlated with the two scales (emotion regulation- child age: $r(79) = -.03$, $p = .77$; linguistic competence: $r(79) = -.10$, $p = .38$; lability/negativity- child age: $r(79) = -.02$, $p = -.02$, $p = .88$; linguistic competence: $r(79) = -.01$, $p = .93$).

Positive Coping. This was a researcher developed parent-report measure that was designed to investigate how well the child does coping with positive emotions and situations that the child might find overwhelming (e.g., surprises, very good news). It was a 5-item measure with questions such as 'When your child experiences a very positive emotion, how often do they scream or shout for joy?', 'When your child experiences a very positive emotion, how often do they become hard for you to control?' All questions were answered with a 5-point scale (0 = Never to 4 = Always). The scale initially demonstrated poor reliability ($\alpha = .67$), but was improved by removing one item ($\alpha = .73$, 'Does child scream or shout for joy'; $M = 4.48$, $SD = 2.32$). A test of differences between conditions did not reveal any significant differences for exposure to the Froot Loops/D'animals or Trix/Splitz commercials, $t(77) = 0.07$, $p = .94$.

In addition, similar to the other developmentally based measures used in this study, parent ratings on child coping were compared with child age and linguistic competence. There were no differences in parent ratings based on either age ($r(79) = -.05$, $p = .64$) or language abilities ($r(79) = -.01$, $p = .92$).

Consumer Behavior

The dissertation tested the following three aspects of the child's consumer behavior and development.

Purchase Requests & Purchase Conflict. This set of questions was adapted from Buijzen & Valkenburg (2003). While the original measure only assessed the purchasing of 4-items, the measure used for the current study increased the number of products that were asked about. Specifically, this measure was a 10-item parent-report measure of children's purchase requests and purchase conflict. The products included were: toys, media products (e.g., DVDs), candy, video games, clothes, snack food, fast-food restaurants, non fast-food restaurants, movies, and amusement parks.

The measure of purchase requests asked parents to indicate how often the child asked them to buy the selected goods (0 = 'Never'; 3 = 'Always'). The scale demonstrated adequate reliability ($\alpha = .71$; $M = 15.42$, $SD = 3.82$). Parents were then presented with a follow up question which asked how intense arguments with their child are over the purchase of these selected consumer goods (0 = 'Never'; 3 = 'Always'). The scale demonstrated very good reliability ($\alpha = .88$; $M = 10.46$, $SD = 5.20$). I then tested whether there were differences between conditions regarding how children performed of this measure of parent-report. According to parents, children in the Trix/Splitz condition ($M = 16.26$, $SD = 3.34$) made significantly more purchase requests than children in the Froot Loops/D'animals ($M = 14.60$, $SD = 4.11$) condition, $t(77) = -1.96$, $p = .05$. There were no differences between conditions for the amount of purchase conflict children engaged in with their parents, $t(77) = -1.23$, $p = .22$.

Consumer Socialization. This set of questions asked what the family habits are concerning shopping and how involved the child is with the family's shopping habits. This measure was taken from an earlier study where the scale demonstrated good

reliability (Rose, 1995). The scale is split up into two separate sub-scales with all items measured with a 5-point Likert scale (0 = 'Never'; 4 = 'Always').

Seven of the questions centered on how often the parent spoke with his or her child about consumer decisions (e.g., 'I ask my child about what he/she thinks about the things he/she buys for himself/herself', 'I ask my child for advice about buying things'). This sub-scale demonstrated adequate internal consistency ($\alpha = .71$; $M = 15.19$, $SD = 3.27$). The other three items of this scale asked parents how often they took their child along when they went shopping (e.g., 'When I go general family shopping, I take my child', 'When I shop for my child, I take him/her along'). The scale demonstrated good reliability ($\alpha = .84$; $M = 7.91$, $SD = 2.39$). Tests were conducted to determine whether there were any differences between the two experimental conditions with both of these measures. There were no significant differences (parent has consumer based discussions with the child: $t(77) = -0.45$, $p = .65$; parent involves child in shopping: $t(77) = -0.14$, $p = .89$).

Consumer Development. This parent-report measure was used to determine two aspects of consumer development and was taken from a previous study where the two scales demonstrated adequate to good reliability (Rose, 1995). One sub-scale was included to measure how the child was developing as a consumer, with a focus on how much the child thinks about their consumer purchases as a social statement. The other subscale measured how well the child appeared to understand advertisements and advertiser tactics. All items were measured using a 5-point scale (0 = 'Strongly disagree'; 4 = 'Strongly agree').

The measure of children's advertising understanding was a four-item scale with questions that asked parents how much they agreed with certain statements about their child's advertising understanding (e.g., 'My child knows that advertising is biased', 'My child understands that actors who endorse a product may not really use that product'). This sub-scale demonstrated good reliability ($\alpha = .79$; $M = 7.98$, $SD = 2.86$). The last three questions made up the social aspect of the consumer development sub-scale and asked parents if their child seemed concerned about what other people thought regarding their personal purchases (e.g., 'My child has become concerned about whether his/her purchasing of a consumer product will make a good impression on others', 'My child has become concerned about what his/her friends will think if they buy a certain consumer product'). This sub-scale demonstrated very good reliability ($\alpha = .87$; $M = 5.33$, $SD = 2.57$). Tests were conducted to determine whether there were any differences between conditions. There were no significant differences (child advertising knowledge: $t(77) = -0.08$, $p = .94$; child's concern with social aspects of consumerism: $t(77) = 0.68$, $p = .50$).

Table 4. *Means, Standard Deviations, and Distributional Indicators for All Variables of Interest*

	M	*SD*	*Skew*	*Kurtosis*
Covariates				
Age	7.70	0.88	0.28	-0.86
Linguistic Competence	34.80	3.68	-0.04	-0.28
Independent Variables				
Communicative ToM	1.23	0.60	-0.12	-0.42
Cognitive ToM	1.03	0.64	-0.02	-0.49

	M	*SD*	*Skew*	*Kurtosis*
Parent EF- BRIEF	4.06	1.20	-0.24	1.07
Child EF	2.01	1.43	-0.02	-1.31
Parent ER- Emotion Regulation Checklist	371.84	105.68	-0.01	-0.61
Parent ER- Positive Coping	4.48	2.32	0.52	0.07
Child ER- Desired Gift	3.87	0.79	-0.30	-0.30
Child ER- Undesired Gift	2.47	1.19	0.72	-0.52
Dependent Variables				
Knowledge of Selling Intent	3.38	1.17	0.002	0.26
Knowledge of Persuasive Intent	2.86	0.97	-1.01	1.99
Child Purchase Desire	3.38	3.38	-0.23	-0.92
Cereal Eaten	0.15	18.23	-0.04	1.28
Cereal Selection After Advertisements	1.11	0.86	-0.22	-1.63
Cereal/Snack Selection	1.11	0.75	-0.19	-1.19
Child Purchase Requests	0.33	2.50	0.12	1.16
Parent Reported Purchase Requests	15.42	3.82	-0.18	-0.38
Parent Reported Purchase Conflict	10.46	5.20	-0.07	0.19

Analysis Strategy

Executive Function Variables Used

One set of hypotheses test whether children's cognitive control capabilities (i.e., executive function) influence their susceptibility to advertisements and their desire for consumer goods as this study predicts that as children's executive function improves, children's susceptibility to advertisements and their purchase desires/requests should decrease. However, before testing these hypotheses, it is necessary to discuss the divergence in results from the parent reported measures of executive function and the results from the child observations of executive function and how these variables will be handled during hypothesis testing. Furthermore, since this study uses a number of measures for executive function, particularly with children, it is necessary to determine which precise variables will be used in the analyses.

As seen in table four, children's performance on the tests of observed executive function (e.g., errors made, reaction time) were not uniformly correlated with parent measures of children's executive function. The tests of children's executive function that were significantly or marginally correlated with the various parent measures were: the grouped error on the executive function tests with the parent measure of response inhibition ($r(79) = .24$, $p < .05$), the reaction time from the flanker test with the working memory parent report scale ($r(79) = .20$, $p < .09$), and the test of working memory with both the overall measure of executive function ($r(79) = -.21$, $p < .07$), and the working memory scale from the parent measure ($r(79) = -.27$, $p < .02$). In addition, when looking at the links between child age and performance on the relevant measures, child age was consistently and significantly linked with the direct measurements of executive function (with the exception of reaction time performance on the go-no-go test) while age was not

correlated with any of the parent measures of executive function. In fact, none of the parent reported executive function measures were even marginally correlated with child age.

Table 5. *Zero Order Correlations for Adult and Child Measures of Executive Function*

	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Child age	.60**	-.05	.17	-.01	.05	-.29**	-.10	.06	-.09	-.11	-.29*	.29*	.31**	-.36**
2. Linguistic competence		-.21+	.12	-.17	-.08	-.27*	-.12	-.09	-.07	-.03	-.11	.32**	.29*	-.27*
3. BRIEF- Inhibit scale			.42**	.50**	.79**	.08	.16	.09	.02	.04	.17	-.19+	-.18	.23*
4. BRIEF- Shift scale				.43**	.69**	.12	.07	-.23*	.03	.11	-.03	-.03	-.01	-.14
5. BRIEF- Working memory scale					.82**	.10	.15	-.04	-.07	-.07	.11	-.27*	-.25*	.17
6. BRIEF- Full scale						.12	.16	-.04	-.02	.01	.14	-.21+	-.19+	.14
7. Go/No Go- Correct trials RT							.73**	-.30**	.17	.06	-.06	-.26*	-.26*	.02

	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
8. Go/No Go- Correct trials SD								.01	.04	-.04	-.06	-.11	-.10	.12
9. Go/No Go- Trolls caught									-.02	.02	.13	.18	.20^{+}	.42**
10. Flanker test- RT difference all values										.91**	.49**	.10	.09	.02
11. Flanker test- RT difference extreme values removed											.46**	.14	.13	-.01
12. Flanker test- Errors made												-.15	-.16	.48**

	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
13. Working memory- Number correct													.99**	-.65**
14. Working memory- Adjusted score														-.64**
15. Executive function- grouped errors														

Note: + $p < .10$, * $p < .05$, ** $p < .01$; RT = Reaction time

This divergence of performance on the child and parent measures of executive function, coupled with the lack of a relationship on the parent measure and child age, suggests that these two measures are targeting two distinctively different constructs related to executive function. With regard to the parent measure, the BRIEF is a widely used, reliable, and validated measure of executive function with children ranging in age from preschool to adolescence (Gioia, Isquith, Guy, & Kenworthy, 2000; Mahone et al., 2002; McCandless & O'Laughlin, 2007). Moreover, the BRIEF has been linked with important social and behavioral outcomes such as attentional issues in school (Toplak, Bucciarelli, Jain, & Tannock, 2008), academic outcomes for children (Anderson, Storfer-Isser, Taylor, Rosen, & Redline, 2009); school discipline issues (Wehmeier, Schacht, & Barkley, 2010); later criminal behaviors (Fago, 2003); and interpersonal difficulties with others (Riggs, Blair, & Greenberg, 2004). Conversely, the child tests of executive function are not only reliable, valid and widely used measures of executive function (e.g., reverse digit span- Gathercole & Pickering, 2000; go/no go test- Bunge et al., 2002; flanker test- Rueda et al., 2004) but as shown above, are also correlated with child age and linguistic competence suggesting that they are capturing essential elements of children's development.

Past research that has explored the relationship between parent report on the BRIEF, direct observations with children, and child age, has shown that the parent measure is not often correlated with either direct observation or child age (e.g., Mahone et al., 2002; Mangeot et al., 2002; Toplak, Bucciarelli, Jain, & Tannock, 2008; Vriezen & Pigott, 2002). For example, Mahone and colleagues assessed children using the BRIEF,

performance based executive function measures (Go/No-Go, Tower of London), and psychoeducational measures, the researchers found that the parent measure was not correlated with the executive function tasks, psychoeducational measures (with the exception of a math achievement test), or child age.

This difference in parent report and child performance on the measures of executive function is likely because the parent report of executive function explores a specific range of behaviors that are thought to capture and diagnose clinical problems with executive functioning (e.g., ADHD, school discipline issues) while the direct measurement of child executive function is a more pure measure of cognitive skill. With this in mind, the two varying types of observations for executive function were used separately to test whether advertising susceptibility and purchase requests were linked to executive function.

In looking at what executive functions measures will be used in the analysis, the combined scales from BRIEF will be used for tests looking at parent reported executive function and consumer outcomes. For the child measures, the choice in measurement is between the reaction time measures from the computer tasks and errors made on these tasks (or some combination of the two). Of these options, the best one would appear to be using the measure of errors made during the three executive function tasks. First, this measure combines performance on all three executive function tasks, thus giving a more complete view of children's cognitive development. Second, this measure was significantly correlated with both child age and linguistic competence. Conversely, the reaction time measures are not uniformly correlated with either age or linguistic competence, do not take into account performance on the working memory task, and,

more importantly, are not correlated with one another. A combination of the reaction time measures and the errors made would likely not be an effective measure as children's errors made on these tasks were not correlated with any of the reaction timed measures. Consequently, for tests investigating the influence of child observed executive function on consumer behavior, the number of errors made on the three tasks will be used in the analysis.

Analysis Strategy

An initial set of tests looking at simple association were conducted using zero-order correlations for both the independent variables and dependent variables. These tests were conducted to determine whether any of the variables of interest were initially linked.

For the primary tests of all hypotheses, a series of multiple regressions were performed. Specifically, with the test of hypothesis 1a and 1b (theory of mind performance will be positively associated with knowledge of persuasive and selling intent); child age and child's verbal ability, served as covariates, with knowledge of persuasive and selling intent serving as the respective dependent variables. Children's performance on the two separate categories for the theory of mind tests. The hypothesis was considered supported if either of the theory of mind tasks were significantly and positively associated with children's knowledge of both persuasive and/or selling intent. Using the regressions that tested hypotheses one and two, research question will explore which theory of mind tests were the strongest predictors for knowledge of selling and persuasive intent. Finally, for hypothesis two, the hypothesis predicting that children will have higher scores on their knowledge of selling intent than their knowledge of persuasive intent, a paired t-test will be used.

For hypothesis three (a: executive function will be negatively associated with advertising susceptibility; b: executive function will be negatively associated with purchase desire) executive functioning performance will serve as the independent variable in the regression analysis, while the measures for advertising susceptibility (advertising susceptibility and purchase desire, respectively) will serve as the dependent variables in separate tests. Hypothesis 4 (parent reported purchase requests will be negatively associated with executive function) will be tested using the same procedures and will be considered to have received sufficient support if executive function is negatively and significantly associated with purchase requests. For the tests of emotion regulation (hypothesis 6a, 6b and 7), the exact same procedures will be used.

Covariate Inclusion. Hierarchical multiple regression analyses were planned for almost all final model analyses. Two variables were included as covariates in each of these models: child age and child linguistic ability. These two variables were included because of their well-established relationship with children's general cognitive development and cognitive ability. Furthermore, previous research on children's consumer development have used both of these variables as a way to explain why certain children are more susceptible to advertising than other children or why certain children are more likely to understand the true purpose of commercial messages (see Chernin, 2007, Ward, Wackman, & Wartella, 1977). As such, these variables were included in order to test whether the selected independent variables (executive function, emotion regulation, theory of mind) were able to predict performance on the various dependent variables while simultaneously accounting for the effects of age and linguistic competence. If these variables do predict consumer behavior and consumer knowledge above and beyond the

effects of age and linguistic ability, a broader case can be made suggesting that these earlier models of consumer development have missed important explanatory variables.

As can be seen in table four, age and linguistic competence were significantly and strongly correlated, $r(79) = .60$, $p < .001$. This strong correlation between these two variables raises potential concerns of multicollinearity impacting hypothesis testing. As such, age and linguistic competence were centered for all models to guard against the impacts of multicollinearity (Tabachnick & Fidell, 2001).

Preliminary Analyses

Manipulation Check

A series of tests were conducted to determine if exposure to the experimental stimuli affected children's assessment of the associated consumer products. Specifically, I tested whether children were more likely to indicate that they liked, expressed purchase desire, consumed, or choose the product after being exposed to the commercial advertisements. The first of these tests looked at product liking at post-test for Trix, Froot Loops, Splitz, and D'animals by condition while controlling for children's liking of the product at pre-test. When testing exposure to Froot Loops, the opposite was actually found as children in the Trix/Splitz condition (M = 1.48, SE = 0.16) were marginally more likely to say that they liked Froot Loops more than children in the Froot Loops/D'animals (M = 1.09, SE = 0.15) condition ($F(1,76) = 3.01$, $p = .08$, partial-η^2 = .04). There was no clear evidence for persuasion effects for exposure to Trix cereal as children in the Trix/Splitz condition did not report liking Trix (M = 1.22, SE = 0.20) significantly more than children in the Froot Loops/D'animals condition (M = 1.06, SE = 0.20; $F(1,76) = 0.34$, $p = .56$, partial-η^2 = .004).

An exploration for children's liking of yogurt snacks based on condition did not produce any apparent persuasion effects. With regard to children's liking of D'animals, children in the Froot Loops/D'animals exposure group were not more likely to say that they liked the snack more (M = 0.73, SE = 0.18) than children in the Trix/Splitz condition (M = 0.84, SE = 0.19; $F(1,76) = 0.20$, $p = .66$, partial-η^2 = .003). A similar look at persuasion effects for exposure to the Splitz commercial yielded similar effects for child reported liking of the product. Children in the Trix/Splitz condition did not report liking

Splitz (M = 0.47, SE = 0.15) more after exposure to the advertisement than children in the Froot Loops/D'animals condition (M = 0.59, SE = 0.15; F(1,76) = 0.38, p = .55, partial-η^2 = .01).

The next set of tests explored whether children were more likely to state that they wanted their parent to purchase the consumer goods they were exposed to during viewing (with purchase desire at pre-test included as a covariate). The first product exposure to be tested was Froot Loops and there were no apparent persuasion effects based on exposure to the advertisement as children in the Froot Loops/D'animals condition (M = 0.89, SE = 0.18) were not more likely to state that they wanted their parent to purchase the cereal for them versus children who were not exposed to the advertisement (M = 0.83, SE = 0.19; F(1,76) = 0.06, p = .81, partial-η^2 = .001). Persuasion effects for exposure to the Trix commercial were then tested, no such effects were found. Children in the Trix/Splitz condition (M = 1.07, SE = 0.19) were not significantly more likely to state that they wanted their parents to purchase the cereal after advertisement exposure when compared to the children in the Froot Loops/D'animals (M = 1.01, SE = 0.19; F(1,76) = 0.06, p = .81, partial-η^2 = .001).

When looking at persuasion effects for exposure to the yogurt snack commercials on children's purchase desire, the results suggest that exposure to the stimulus ads did little to change children's attitudes towards either product. With regard to the influence of the D'animals advertisement, children exposed to this commercial did not indicate that they wanted their parents to buy this snack (M = 0.72, SE = 0.20) any more than children who were not exposed to the advertisement (M = 0.80, SE = 0.20; F(1,76) = 0.08, p = .77, partial-η^2 = .001). In addition, exposure to the Splitz advertisement had little impact on

children in that experimental group relative to the control group. Children exposed to the Splitz commercial were not more likely to state that they wanted their parent to purchase the product (M = 0.83, SE = 0.15) when compared to children in the Froot Loops/D'animals condition (M = 0.61, SE = 0.15; $F(1,76) = 1.07$, $p = .30$, partial-η^2 = .014).

The next manipulation check for persuasion effects investigated whether exposure to the cereal commercials affected children's cereal consumption (both in the amount eaten and which cereal the child ate after viewing the commercial). The first set of tests explored how much cereal children ate after exposure to the advertisement they were assigned to view while controlling for the initial amount of cereal given to them (the means reported below indicate how much cereal [in grams] was left in the cereal bowl after exposure). The results from both of these findings indicate no persuasion effects for commercial exposure on cereal consumption. Children selected to view the Froot Loops commercial during the *SpongeBob SquarePants* episode did not consume more Froot Loops (M = 21.60, SE = 1.35) than children who did not see the commercial for Froot Loops (M = 21.10, SE = 1.38; $F(1,76) = 0.07$, $p = .80$, partial-η^2= .001). Similarly, children selected to view the Trix commercial did not eat significantly more of that cereal (M = 20.82, SE = 1.22) than children who did not see that particular commercial (M = 20.22, SE = 1.20; $F(1,76) = 0.12$, $p = .73$, partial-η^2= .002).

The tests looking at persuasion effects for which cereal was immediately consumed after exposure to the experimental manipulation did offer some evidence for persuasion, although the effects were not significant. Using chi-square tests, I tested whether children were more likely to eat the experimental cereal after exposure to the

stimulus commercial. After viewing the first commercial, children were not significantly more likely to eat the cereal for the commercial to which they were exposed to, but there was a trend suggestive of persuasive effect ($\chi^2(1) = 3.74$, $p = .15$). Of the children in the Froot Loops/D'animals condition, 52.5% of them first selected Froot Loops immediately after watching the commercial versus 37.5% of children who ate Trix first and 10% who did not eat any cereal. A similar pattern was found with children in the Trix/Splitz condition, 59% of these children ate from their bowl of Trix first after the commercial compared to 35.9% of these children who chose Froot Loops and 5.1% of the children in this condition choosing neither.

Children's reactions after watching the second commercial followed the same pattern as their reactions after watching the first commercial as there was a trend suggesting persuasion effects for exposure to the commercials, $\chi^2(1) = 4.47$, $p = .11$. With regard to children in the Froot Loops/D'animals condition, the same percentages for cereal consumption after watching the first commercial was found (52.5% ate Froot Loops, 37.5% ate Trix, 10% did not eat). Regarding those in the Trix/Splitz condition, these children ate from their bowl of Trix in 59% of cases, ate first from the bowl of Froot Loops in 38.5% of cases, and did not eat either cereal in just one case (2.6%).

The next set of tests for the manipulation check involved whether children were persuaded to choose the cereal or snack for the advertisements that they were exposed to during the *SpongeBob SquarePants* viewing. Specifically, for the last two questions of the consumer assessment children were asked to pick either Froot Loops or Trix and either D'animals or Splitz. Looking at children's responses for these questions, the results indicate that there were either no persuasion effects for the advertisements or if they did

exist, they were very slight. The test of cereal choice was not significant, $\chi^2(1) = 1.13$, $p = .29$, and the findings were quite interesting. Specifically, children in the Froot Loops condition were actually more likely to select Trix (55%) over Froot Loops (45%) while children in the Trix condition overwhelmingly chose Trix cereal (66.7%) as opposed to Froot Loops (33.3%). As such, it appears that there was a noticeable trend whereby children were more inclined to select Trix beyond the effect of the advertisement, and children's cereal selection at the pre-test provide support for this point. At pre-test, children assigned to the Trix condition were more likely to select this cereal (61.5%) over Froot Loops (38.5%) with only two children switching from Froot Loops to Trix from pre-test to post-test.

Finally, there was a slight trend suggesting that exposure to the snack commercial had a persuasive influence on children although the effect was not significant, $\chi^2(1) = 3.67$, $p = .16$. In looking at children's reactions to the D'animals commercial, a slight majority of children chose D'animals (57.5%) over Spliz (42.5%). The persuasive effect of watching the Splitz commercial was even slighter. Children in this condition selected Splitz just 53.8% of the time, selected D'animals 41% of the time, and declined to choose a snack in 5.1% of cases.

Taken in full, the results from the various manipulation checks reveal that the stimulus advertisements did little to persuade children across a number of different measures ranging from consumer attitudes and consumer behavior. The most promising results suggesting a persuasive effect for the advertisements are the measures of cereal consumption after watching the stimulus advertisements and cereal/snack selection at the end of the assessment, but even these effects were not marginally significant and only

suggested a trend for persuasive effect. In fact, the only marginally significant effect when looking at persuasion effects found the opposite, as children in the Froot Loops condition were found to like that cereal less than children in the Trix condition.

The lack of any clear persuasive effect for exposure to these commercials is troubling and may prove problematic for hypothesis testing. With these minimal effects for persuasion it is unlikely that these advertisements will have measurable effects on the subjects participating in this study. That said, just because there are no significant effects for persuasion on the entire sample does not necessarily mean that these hypotheses will not be supported when looking at individual differences in children. Specifically, these hypotheses posit that children with differing abilities related to executive function and emotion regulation will make one group of children more persuadable than other children. As such, it may be possible that one set of children (i.e,. those with more advanced executive function and emotion regulation) evidence no persuasive pull or exhibit slight resistance to the persuasive messages while the children with less developed executive function and/or emotion regulation are persuaded by the advertisements.

Results

Zero Order Correlations for Variables of Interest

Tables five and six show the zero order correlations for the dependent variables, independent variables, and the two covariates. As can be seen in the table five, child age was significantly correlated with linguistic competence ($r(79) = .60$, $p < .001$), child reported purchase requests ($r(79) = -.32$, $p < .01$), and knowledge of selling intent ($r(79) = .30$, $p < .01$). Child age was also marginally related to children's knowledge of persuasive intent ($r(79) = .19$, $p < .09$). Similarly, children's performance on the measure of language knowledge was significantly correlated with child reported purchase requests ($r(79) = -.24$, $p < .05$) and knowledge of selling intent ($r(79) = .30$, $p < .01$). Child language skills were also correlated with parent reported purchase requests ($r(79) = -.24$, $p < .05$).

When looking at the relations between the dependent variables, a few significant correlations emerge. Unsurprisingly, children who asked for more consumer goods from parents argued more with their parents ($r(79) = .55$, $p < .001$); however, children who were reported to have made more purchase requests to parents also scored lower on the measure of knowledge of selling intent ($r(79) = -.32$, $p < .01$) and were marginally more likely to select the products they were exposed to when viewing the television program ($r(79) = .22$, $p < .06$). Children who were more likely to indicate that they would want their parents to purchase the consumer goods shown to them in the first assessment were more likely to select the products they were exposed to ($r(79) = .40$, $p < .001$), had lower scores on the measure of knowledge of selling intent ($r(79) = -.26$, $p < .05$), and marginally ate more of the cereal that was featured in the advertisements ($r(79) = .19$, $p <$

.09). Children who ate more of the cereal that they were exposed to during the second assessment were also more likely to select the products they were exposed to ($r(79) = .25$, $p < .05$) and were more likely to eat from the bowl of the advertised cereal after exposure ($r(79) = .59$, $p < .001$). The results also revealed that those children who said that they wanted their parent to buy the advertised products were significantly more likely to eat from the bowl of the advertised cereal after exposure ($r(79) = .26$, $p < .05$) and had lower scores on the measure of knowledge of selling intent ($r(79) = -.27$, $p < .05$). Lastly, children with lower scores on the knowledge of selling measure also had lower scores on the measure of knowledge of persuasive intent ($r(79) = .40$, $p < .001$).

Table six shows how the independent variables were correlated. Child age was significantly correlated with children's communicative theory of mind ($r(79) = .35$, $p < .01$), cognitive theory of mind ($r(79) = .30$, $p < .01$), and children's performance on the measure of executive function ($r(79) = -.33$, $p < .01$). Child language skills were correlated with the two measures of testing children's theory of mind (communicative: $r(79) = .34$, $p < .01$; cognitive: $r(79) = .27$, $p < .05$).

A number of the dependent variables were also correlated. Children's communicative theory of mind was positively correlated with communicative theory of mind ($r(79) = .25$, $p < .05$) and negatively correlated with children's performance on the executive function tasks ($r(79) = -.22$, $p < .05$). Likewise, children's performance on the measure of cognitive theory of mind was negatively correlated with children's performance on the executive function tasks ($r(79) = -.26$, $p < .05$). Parent reported executive function was negatively correlated with parent reported emotion regulation ($r(79) = -.28$, $p < .05$), positively correlated with the parent measure of child coping

($r(79) = .49$, $p < .001$), and child observed reaction to the desired gift ($r(79) = .25$, $p < .05$). The parent measure of emotion regulation was negatively correlated with the parent measure of child coping ($r(79) = -.23$, $p < .05$). Lastly, the measure of child coping with positive situations was marginally correlated with children's reactions to the desired gift ($r(79) = .20$, $p < .10$) and the undesired gift ($r(79) = -.20$, $p < .10$).

Table 6. *Zero Order Correlations for All Dependent Variables and Covariates*

	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Child Age	.60**	-.16	.02	-.13	-.32**	-.08	-.02	.04	.30**	.19+
2. Linguistic Competence		-.24*	.03	-.04	-.24*	.08	-.05	-.04	.30**	.16
3. Parent Reported Purchase Requests			.55**	.14	.11	.14	.22+	-.03	-.32**	-.07
4. Parent Reported Purchase Conflict				.16	-.11	.17	.04	.07	-.10	.16
5. Child Purchase Requests					.14	.29**	.28*	.16	.03	-.07
6. Child Purchase Desire						.19+	.40**	.18	-.26*	-.13

	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
7. Experimental Cereal Eaten							.25*	.59**	.15	.17
8. Experimental Products Chosen								.26*	-.27*	-.05
9. Experimental Cereal Eaten After Commercials									.16	.16
10. Selling Intent										.40**
11. Persuasive Intent										

Note: **p < .01, *p < .05, +p < .10

Table 7. *Zero Order Correlations for All Independent Variables and Covariates*

	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Child Age	.60**	.35**	.30**	.05	-.03	-.05	-.36**	.05	-.01
2. Linguistic Competence		.34**	.27*	-.08	-.12	-.01	-.27*	-.04	-.02
3. Communicative ToM			.25*	.02	-.03	-.07	-.29*	.08	-.05
4. Cognitive ToM				.002	-.14	-.12	-.38**	.17	.02
5. Parent Reported EF					-.28*	.49**	.14	.25*	-.05
6. Parent Reported ER						-.23*	.17	.08	.08
7. Parent Reported Positive Coping							.15	.20+	-.20+
8. Child Observed EF								.05	.11
9. Child Liking- Desired Gift									.13
10. Child Liking- Undesired Gift									

Note: ToM = Theory of Mind, EF = Executive Function; **p < .01, *p < .05, +p < .10

Predicting Knowledge of Persuasive and Selling Intent

H1a. *Children's increased performance on the theory of mind tasks will be positively associated with their knowledge of selling intent, after controlling for age and language fluency.*

H1b. *Children's increased performance on the theory of mind tasks will be positively associated with their knowledge of persuasive intent, after controlling for age and language fluency.*

RQ1. *Which of the theory of mind tasks will be the strongest predictors for children's knowledge of selling and persuasive intent?*

H2. *Children's knowledge of selling intent will precede their knowledge of persuasive intent.*

This study posits that children's knowledge of both selling and persuasive intent are dependent upon children's social-cognitive development. Specifically, children's awareness of advertiser intent is predicated on their development of theory of mind. As noted previously, theory of mind is not something that develops at a singular point; rather, it represents a series of increasingly complex competencies regarding children's understanding of other person's mental states and communicative intent (Wellman & Liu, 2004).

In this study, it was hypothesized that children's performance on the theory of mind tasks would be positively associated with knowledge of selling intent (H1a) and knowledge of persuasive intent (H1b). Knowledge of selling intent was defined as the awareness that advertisements are designed to sell products to the audience (i.e., convince the audience to go buy the product being advertised) while knowledge of persuasive

intent was defined as the awareness that advertisements are intended to engender favorable responses to the product (i.e., convince the audience to like the product; Kunkel, 2010). A research question was included to determine whether the communicative based theory of mind tests or the cognitive tests of theory of mind were the stronger predictors of persuasion and selling knowledge. Lastly, I predicted that knowledge of selling intent will predict knowledge of persuasive intent.

To address hypotheses 1a, 1b, and research question 1, multiple regressions with knowledge of selling intent and knowledge of persuasive intent as the respective dependent variables were conducted. In addition, because past research has shown that both age (Ward, Wackman, and Wartella, 1977) and verbal ability (Chernin, 2007) predict advertising knowledge, these two variables were entered as control variables in the model. The hypothesis related to theory of mind and knowledge of selling intent (H1a) was confirmed and the model was significant ($F(4,74) = 3.64$, $p < .01$), although only the cognitive theory of mind tasks were a significant predictor of children's knowledge of selling intent (see Table 7). Specifically, children who successfully completed the first and second-order false belief tasks (i.e., knowledge about somebody else's knowledge about somebody else) were significantly more likely to score higher on the measure of selling intent ($\beta = .25$, $p < .05$) even after controlling for both child age and linguistic ability (measure of communicative theory of mind: $\beta = -.10$, $p = .40$). Interestingly, neither age ($\beta = .15$, $p = .27$) or linguistic ability ($\beta = .17$, $p = .21$) were significant predictors of knowledge of selling intent when performance on the theory of mind tasks were included in the model.

Table 8. *Multiple Regression Predicting Knowledge of Selling Intent by Theory of Mind*

	B	SE	β	t	p
Constant	-.30	1.31		-.23	.82
Child age	.20	.18	.15	1.11	.27
Linguistic competence	.05	.04	.17	1.26	.21
Cognitive ToM	.45	.21	.25	2.17	.03
Communicative ToM	-.19	.23	-.10	-.84	.40

Notes: *ToM* = Theory of Mind

Contrary to expectations, the test for children's theory of mind and knowledge of persuasive intent was not significant. As table 8 indicates, neither the communicative (β = -.11, p = .40) or cognitive theory (β = .02, p = .87) of mind tasks were linked to knowledge of persuasive intent, $F(4,74) = 0.97$, p = 0.43. Moreover, neither age nor linguistic competence were significant predictors for children's persuasion knowledge.

Table 9. *Multiple Regression Predicting Knowledge of Persuasive Intent by Theory of Mind*

	B	SE	β	t	p
Constant	.79	1.16		.68	.50
Child age	.20	.16	.18	1.21	.23
Linguistic competence	.02	.04	.08	.56	.58
Cognitive ToM	.03	.18	.02	.16	.87
Communicative ToM	-.17	.20	-.11	-.85	.40

Notes: *ToM* = Theory of Mind

Research question one asked which types of theory of mind tasks were the best predictors for children's advertising based knowledge. The results indicate that of the two types of tests, the only type that was a significant predictor for any display of advertising knowledge were the cognitively based theory of mind tasks and this only held for knowledge of selling intent and not for knowledge of persuasive intent. When looking at the results for the other set of theory of mind tasks, they did not even trend towards significance in these tests (i.e., whether child recognized that a person can feel one way yet show the opposite emotional cues).

The last hypothesis relating to children's understanding of advertiser intent, posited that children's knowledge of selling intent would precede children's knowledge of selling intent. To test this hypothesis, a paired samples t-test was used with knowledge of persuasive intent and knowledge of selling intent serving as the paired test. The results indicate that while knowledge of selling and persuasive intent were significantly correlated ($r(79) = .38$, $p < .001$), children's scores on knowledge of selling intent ($M = 3.39$, $SD = 1.17$) were consistently higher ($t(78) = 3.89$, $p < .001$) than their scores on knowledge of persuasive intent ($M = 2.86$, $SD = 0.97$).

Cognitive Control and Persuasion Susceptibility

H3a. *After controlling for age and language fluency, children's performance on executive functioning (both the executive functioning tasks and parent report of executive functioning) will be negatively associated with advertising susceptibility.*

H3b. *After controlling for age and language fluency, children's performance on executive functioning (both the executive functioning tasks and parent report of*

executive functioning) will be negatively associated with child-reported purchase desire for advertised products.

H4. *After controlling for age and language fluency, children's performance on executive functioning (both the executive functioning tasks and parent report of executive functioning) will be negatively associated with parent-reported purchase requests.*

The test of hypothesis 3a included four separate tests of advertising susceptibility dependent variables and included both age and linguistic competence as control variables. The rationale for using separate tests of advertising susceptibility was because the measures were quite distinct and addressed different aspects of consumer behavior. In addition, as noted above, the parent measure and child measure were tested separately, with the parent measures presented first. The first test of advertising susceptibility investigated the amount of cereal children ate after viewing the cereal commercials using a hierarchical multiple regression. The first step in the regression included child age and child linguistic competence as control variables, and the complete model was not significant, $F(3,75) = 0.76$, $p = .52$, $R^2 = .03$, and neither child age ($\beta = -.19$, $p = .20$) nor linguistic competence ($\beta = -.18$, $p = .21$) were significant predictors for cereal eating. The addition of parent reported executive function was also not significant ($\beta = -.03$, $p = .78$).

The next test of advertising susceptibility tested whether children reached for the advertised cereal immediately after watching those particular advertisements using a hierarchical multiple regression. The first step in the regression included child age and

Table 10. *Multiple Regression Predicting Experimental Cereal Eaten by Parent Reported Executive Function*

	B	SE	β	t	p
Constant	2.12	7.39		.29	.77
Child age	-3.84	2.99	-.19	-1.29	.20
Linguistic competence	.91	.71	.18	1.27	.21
Parent Reported EF	-.49	1.74	-.03	-.28	.78

Notes: *EF*= Executive Function

linguistic competence. The complete model was not significant, $F(3,75) = 0.28$, $p = .84$, $R^2 = .01$, and neither variable significantly predicted whether children ate the cereal after watching the commercials (child age: $\beta = .10$, $p = .52$; linguistic competence: $\beta = -.09$, $p = .52$). Furthermore, the addition of parent reported executive function did not significantly predict whether children ate the cereal after watching the commercial ($\beta = .05$, $p = .66$).

Table 11. *Multiple Regression Predicting Experimental Cereal Eaten After Advertisements by Parent Reported Executive Function*

	B	SE	β	t	p
Constant	.96	.35		2.74	.01
Child age	.09	.14	.10	.65	.52
Linguistic competence	-.02	.03	-.09	-.65	.52
Parent Reported EF	.04	.08	.05	.45	.66

Notes: *EF*= Executive Function

The third test of advertising susceptibility explored whether children picked the advertised products (including both the cereal and the yogurt snack) over the products that were not advertised (see Table 11 below). Similar to the earlier advertising susceptibility tests, a hierarchical multiple regression was used to test this hypothesis. The results from the model were not significant, $F(3,76) = 0.10$, $p = .96$, $R^2 = .004$, and neither control variable significantly predicted whether children selected the advertised products (child age: $\beta = .02$, $p = .90$; linguistic competence: $\beta = -.06$, $p = .67$). The addition of parent reported executive function was also not significant ($\beta = -.04$, $p = .72$) as children with less developed executive function were no more or less likely to choose the advertised product over the product that was not advertised.

Table 12. *Multiple Regression Predicting Experimental Product Choice by Parent Reported Executive Function*

	B	SE	β	t	p
Constant	1.22	.31		3.97	.001
Child age	.02	.13	.02	.13	.90
Linguistic competence	-.01	.03	-.06	-.42	.67
Parent Reported EF	-.03	.07	-.04	-.36	.72

Notes: *EF*= Executive Function

The last hypothesis test for advertising susceptibility explored whether parent reported executive function was positively associated with children being more likely to say that they would like their parents to purchase the advertised products over the products that were not advertised while controlling for both child age and child's linguistic competence. Using a hierarchical multiple regression, the model was not

significant, F(3,75) = 0.58, p = .63, R^2 = .02, as neither child age (β = -.16, p = .26) nor child linguistic ability (β = .06, p = .71) predicted purchase requests for the advertised products. With regard to the variable of interest, parent reported executive function did not significantly predict child reported purchase requests (β = -.05, p = .67).

Table 13. *Multiple Regression Predicting Child Reported Purchase Request by Parent Reported Executive Function*

	B	SE	β	t	p
Constant	.75	1.01		.74	.46
Child age	-.47	.41	-.16	-1.14	.26
Linguistic competence	.04	.10	.06	.38	.71
Parent Reported EF	-.10	.24	-.05	-.43	.67

Notes: *EF*= Executive Function

Child Observed Executive Function and Advertising Susceptibility

The following tests investigated whether children's performance on the observed executive function tests predicted their performance on the varying measures of advertising susceptibility. These tests used children's cumulative error rate on the executive function tests (i.e., the percent of errors children made on the Go-No-Go test, the Flanker test, and the Working Memory Test) and employed a hierarchical multiple regression to test the relationship. All of the regression models included child age and child linguistic competence as control variables.

The first test investigated whether children's executive function predicted how much of the advertised cereal they ate. As seen below, none of the variables in the model were significant, F(3,75) = 0.79, p = .50, R^2 = .03. Neither child age (β = -.21, p = .17)

nor linguistic competence (β = .18, p = .20) were significant predictors for cereal eating. The addition of the percent of errors made on the tests of executive function was also not significant (β = -.05, p = .67) as performance on the test of executive function was not linked with the amount of experimental cereal children ate.

Table 14. *Multiple Regression Predicting Children's Cereal Eating by Child Observed Executive Function*

	B	SE	β	t	P
Constant	1.49	3.76		.40	.69
Child age	-4.27	3.06	-.21	-1.39	.17
Linguistic competence	.91	.71	.18	1.29	.20
Child Observed EF	-.67	1.56	-.05	-.43	.67

Notes: *EF*= Executive Function

The second test of advertising susceptibility tested whether children reached for the advertised cereal immediately after watching the advertisement using a hierarchical multiple regression. The first step in the regression model included child age and linguistic competence as control variables. Similar to the test above, the model was not significant, $F(3,75) = 0.32$, $p = .73$, $R^2 = .01$, with neither of the control variables significantly predicting whether children ate the cereal after watching the commercials (child age: β = .09, p = .53; linguistic competence: β = -.11, p = .47). More importantly, children's performance on the executive function tests did not significantly predict whether children chose to eat the advertised cereal after exposure to that advertisement (β = -.03, p = .83).

Table 15. *Multiple Regression Predicting Children's Cereal Eating by Child Observed Executive Function*

	B	SE	β	t	P
Constant	1.15	.18		6.39	.001
Child age	.09	.15	.09	.63	.53
Linguistic competence	-.03	.03	-.11	-.73	.47
Child Observed EF	-.02	.08	-.03	-.22	.83

Notes: *EF*= Executive Function

The next test of advertising susceptibility looked at whether children picked the advertised products over the non-advertised product in the post-test. Similar to the earlier advertising susceptibility tests, a hierarchical multiple regression was used to test this hypothesis. The results from the model were not significant, $F(3,75) = 0.08$, $p = .97$, $R^2 = .003$, and neither control variable significantly predicted whether children selected the advertised products (child age: $\beta = .004$, $p = .98$; linguistic competence: $\beta = -.06$, $p = .70$). Children's executive function performance did not predict product choice ($\beta = -.03$, $p = .83$). Namely, children who made more errors on the executive function test were not

Table 16. *Multiple Regression Predicting Children's Product Selection by Child Observed Executive Function*

	B	SE	β	t	p
Constant	1.14	.16		7.29	.001
Child age	.003	.13	.004	.03	.98
Linguistic competence	-.01	.03	-.06	-.39	.70
Child Observed EF	-.01	.07	-.03	-.22	.83

Notes: *EF*= Executive Function

more likely to select those products in post-test.

The last hypothesis test for advertising susceptibility and children's observed executive function tested whether executive function was positively associated with children being more likely to say that they would like their parents to purchase the advertised products over the products that were not advertised. Using a hierarchical multiple regression with child age and child linguistic competence entered as control variables, the model was not significant, $F(3,75) = 0.92$, $p = .45$, $R^2 = .04$, as neither child age ($\beta = -.21$, $p = .15$) nor child linguistic ability ($\beta = .05$, $p = .72$) predicted purchase requests for the advertised products. In addition, child observed executive function did not significantly predict purchase requests from the child ($\beta = -.13$, $p = .28$).

Table 17. *Multiple Regression Predicting Children's Purchase Requests by Child Observed Executive Function*

	B	SE	β	t	P
Constant	.79	.51		1.55	.13
Child age	-.60	.42	-.21	-1.44	.15
Linguistic competence	.04	.10	.05	.36	.72
Child Observed EF	-.23	.21	-.13	-1.08	.28

Notes: *EF*= Executive Function

Executive Function and Child Reported Purchase Desire

During the first data collection session, children were presented with each of the product stimuli and were asked whether they would like their parent to purchase these products. As opposed to the second data collection session, children were asked about these products without additional exposure to the cereal and snack advertisements. The

first test of children's purchase desire included parent reported executive function as the independent variable and included child age and the child's linguistic competence as control variables in a hierarchical multiple regression. The model was significant, $F(3,75) = 4.85$, $p < .01$, $R^2 = .16$. First, younger children were marginally more likely to say that they would like their parents to purchase the products shown to them ($\beta = -.25$, $p < .08$). However, child's linguistic competence was not a significant predictor of purchase desire ($\beta = -.11$, $p = .42$). Parent reported executive function was also a significant predictor of child's purchase desire. However, the direction of the effect was actually contrary to what was originally predicted as children whose parents reported less robust executive function capabilities were *less* likely to say that they would want their parents to purchase these products ($\beta = -.24$, $p < .05$).

Table 18. *Multiple Regression Predicting Children's Reported Purchase Desire by Parent Reported Executive Function*

	B	SE	β	t	p
Constant	6.08	1.27		4.80	.001
Child age	-.95	.51	-.25	-1.84	.07
Linguistic competence	-.10	.12	-.11	-.82	.42
Parent Reported EF	-.67	.30	-.24	-2.22	.03

Notes: *EF*= Executive Function

The next test of this hypothesis used children's observed executive function as the independent variable rather than the parent reported variable, while all other elements of the model were left unchanged. The addition of children's overall performance on the executive function tests did not significantly predict child reported purchase requests as

these children with poorer executive function were no more or less likely to say that they would like their parents to purchase these products (β = .10, p = .40).

Table 19. *Multiple Regression Predicting Children's Reported Purchase Requests by Child Observed Executive Function*

	B	SE	β	t	p
Constant	2.91	.66		4.38	.001
Child age	-.97	.54	-.25	-1.78	.08
Linguistic competence	-.06	.13	-.06	-.45	.66
Child Observed EF	.24	.27	.10	.85	.40

Notes: *EF*= Executive Function

The next set of tests investigated whether parents were more likely to report that their child asked for consumer goods based on the child's performance on the differing executive functioning assessments. Specifically, this study predicted that children with poorer executive function would ask their parents for more consumer goods. The first test used parent report of executive function and included the above stated control variables (i.e,. child age and child linguistic competence) in a hierarchical multiple regression analysis. The model was significant, $F(3,75) = 5.11$, $p < .01$, $R^2 = .17$. As noted in table 19, neither child age nor child language skills were linked with increased purchase requests (child age: β = -.08, p = .54; child linguistic competence: β = -.16, p = .22). As predicted, parent reported executive function was a significant predictor of purchase requests (β = .34, p < .01) as children with less developed executive function were more likely to ask their parents to purchase products.

Table 20. *Multiple Regression Predicting Parent Reported Purchase Requests by Parent Reported Executive Function*

	B	SE	β	t	P
Constant	11.06	1.43		7.75	.000
Child age	-.36	.58	-.08	-.62	.54
Linguistic competence	-.17	.14	-.16	-1.23	.22
Parent Reported EF	1.08	.34	.34	3.18	.002

Notes: *EF*= Executive Function

The last of these tests explored whether children's observed executive function performance was linked to parent reported purchase requests. This test employed the same initial specifications as the previous model and was significant, $F(3,75) = 2.77$, $p < .05$, $R^2 = .10$. Neither of the control variables were significant but child observed executive function was a marginally significant predictor of parent reported purchase requests ($\beta = .22$, $p = .07$) as children who made more errors on the executive function tests were more likely to ask for consumer goods and services, as reported by parents.

Table 21. *Multiple Regression Predicting Parent Reported Purchase Requests by Child Observed Executive Function*

	B	SE	β	t	p
Constant	14.26	.76		18.78	.001
Child age	.16	.62	.04	.25	.80
Linguistic competence	-.21	.14	-.20	-1.46	.15
Child Observed EF	.577	.32	.22	1.83	.07

Notes: *EF*= Executive Function

Emotion Regulation and Advertising Susceptibility

H5a. *After controlling for age and language fluency, children's scores on emotion regulation (both parent report and direct assessment) will be negatively associated with advertising susceptibility.*

H5b. *After controlling for age and language fluency, children's scores on emotion regulation (both parent report and direct assessment) will be negatively associated with child-reported purchase desire for advertised products.*

H6. *After controlling for age and language fluency, children's scores on emotion regulation (both parent report and direct assessment) will be negatively associated with parent-reported purchase requests.*

H7. *Children's emotion regulation abilities will be negatively associated with parent-child conflict with parents regarding purchase request denials.*

The hypotheses investigating the role that emotion regulation plays in children's consumer behavior contend that children's increasing ability to control their emotional reactions to advertising appeals. Specifically, because advertisements targeted to children feature strong affective appeals, children who are better at monitoring and controlling their emotional responses will be less likely to ask their parents for consumer goods and will do a better job at minimizing conflict with parents over the parents' refusal to purchase these consumer goods.

However, similar to the divergence in measurements between children and parents observed with the measures of executive function, the parent and child measure of emotion regulation were not strongly correlated. As seen below (table 21), the parent reported measure of emotion regulation was not correlated with the observed measures of children's emotion regulation and the parent reported measure of child coping was only

marginally correlated with the child observed measure. Moreover, the measures of emotion regulation were not correlated with either child age or linguistic competence.

Table 22. *Zero Order Correlations for Adult and Child Measures of Emotion Regulation*

	2.	3.	4.	5.	6.
1. ERC- Emotion Regulation	.08	.09	-.23*	-.04	-.12
2. Child Observed- Negative Emotion		.13	.20+	.05	-.04
3. Child Observed- Positive Emotion			-.20+	-.01	-.02
4. Parent Observed Child Coping				-.05	-.01
5. Child Age					.60**
6. Linguistic Competence					

Note: **p < .001, *p < .05, +p < .10

In deciding which of the measures were most appropriate to use for hypothesis testing, one problem that was encountered was the comparatively limited research history of these measures. Specifically, as opposed to the measures used for the tests of children's executive function, the measures of emotion regulation have not undergone the same empirical scrutiny that the executive function measures have. The chief measure of parent reported emotion regulation was the Emotion Regulation Checklist (Shields &

Cicchetti, 1997) which has been widely used by researchers but has not undergone the same methodological review that the BRIEF has gone through. The other measure of parent reported emotion regulation was a researcher developed measure and had not been used in any other research.

The child observed measures of emotion regulation in this study were based on a measure that has been used in other research (see Carlson & Wang, 2007; Simonds, Kieras, Rueda, & Rothbart, 2007- with some modifications). Yet, this measure does not enjoy as rich a history in the developmental research as the measures of executive function do. For one, since this measure relies upon participant observation rather than a concrete measure of developmental ability it likely leads to reduced reliance on this measure. Second, since this is a measure that relies on observation, it has typically been customized to fit the individual constraints associated with the particular studies.

With this comparatively limited number of studies that have used these specific measures, it is difficult to know if or whether these measures are appropriately capturing children's emotional development. It is unlikely that both the parent and the child measures are not capturing some aspect of emotion regulation, as they do have some history behind them. It may be that these measures are capturing two differing aspects of emotion regulation. The Emotion Regulation Checklist asks parents to report on a list of behaviors that they have observed with their child over time while the Gift Giving Task is based on observations in the moments immediately preceding when a child receives either a desired or non-desired toy. As such, the Emotion Regulation Checklist may be capturing children's ability to maintain emotional control for longer periods while the Gift Giving Task captures children's ability to control their immediate emotions after

having something good happen or something bad happen. As such, since these measures may be capturing two different aspects of emotion regulation, tests of emotion regulation and its influence on children's consumer behavior were conducted with separate tests.

The first test of children's emotion regulation skills and their influence on purchase requests employed parent report of emotion regulation skills and included age and language fluency as control variables using a hierarchical regression analysis. The model was not significant, $F(3,75) = 1.61$, $p = .20$, as neither child age ($\beta = -.03$, $p = 0.85$) or language fluency ($\beta = -.23$, $p = 0.11$) were linked with parent-reported purchase requests. Furthermore, parent report of children's emotion regulation was not linked to parent reported purchase requests ($\beta = -.05$, $p = 0.63$).

Table 23. *Multiple Regression Predicting Parent Reported Purchase Requests by Parent Reported Emotion Regulation*

	B	SE	β	t	p
Constant	16.15	1.57		10.26	.001
Child age	-.12	.61	-.03	-.20	.85
Linguistic competence	-.24	.15	-.23	-1.62	.11
Parent Reported ER	-.002	.004	-.05	-.48	.63

Notes: *ER*= Emotion Regulation

The second test of children's emotion regulation skills tested whether parent reported coping skills of their children predicted purchase requests with the same covariates noted above (see Table 23). The model was significant, $F(3,75) = 5.48$, $p < .01$, $R^2 = .18$, where child age was not correlated with purchase requests ($\beta = -.004$, $p = 0.97$) but linguistic competence was marginally associated with requests ($\beta = -.23$, $p <$

.09). More importantly, parent reported child coping skills was correlated with purchase requests (β = .35, p = .001), as children who had more difficulty with controlling their reactions to positive stimuli asked their parents for more consumer goods.

Table 24. *Multiple Regression Predicting Parent Reported Purchase Requests by Parent Reported Child Coping*

	B	SE	β	t	p
Constant	12.83	.87		14.77	.001
Child age	-.02	.57	-.004	-.03	.97
Linguistic competence	-.24	.14	-.23	-1.77	.08
Parent Reported Child Coping	.58	.17	.35	3.35	.001

The third test of children's emotion regulation skills explored whether the observations of children's reactions to the toys predicted increased purchase requests from parents. This test included child age and child linguistic ability as control variables and used a hierarchical multiple regression, the model was not significant ($F(4,65) = 1.17$, $p = .33$, $R^2 = .07$). Neither of the control variables explained a significant amount of variance and the observed emotion regulation variables were not significant predictors of parent reported purchase requests (reception of desired gift: β = .09, p = 0.46; reception of non-desired gift: β = -.06, p = 0.65).

Table 25. *Multiple Regression Predicting Parent Reported Purchase Requests by Child Observed Emotion Regulation*

	B	SE	β	t	p
Constant	14.42	2.36		6.10	.001
Child age	-.05	.64	-.01	-.07	.94
Linguistic competence	-.23	.15	-.23	-.1.53	.13
Child Observed ER-Desired gift	.43	.58	.09	.74	.46
Child Observed ER-Non-desired gift	-.18	.38	-.06	-.46	.65

Notes: *ER*= Emotion Regulation

This hypothesis tested whether children with more well developed emotion regulation capabilities would engage in fewer conflicts with parents over purchase request denials. The first test of emotion regulation used the parent-report of children's emotion regulation and included both child age and child linguistic competence as control variables. The regression was not significant, $F(3,75) = 0.52$, $p = .67$ as neither child age ($\beta = .01$, $p = 0.97$) or child linguistic competence ($\beta = .01$, $p = 0.94$) were significant predictors of purchase conflict. More importantly, the addition of parent reported emotion regulation was not significant ($\beta = -.14$, $p = 0.23$).

Table 26. *Multiple Regression Predicting Parent Reported Purchase Conflict by Parent Reported Emotion Regulation*

	B	SE	β	t	P
Constant	13.03	2.19		5.96	.001
Child age	.03	.85	.01	.04	.97
Linguistic competence	.02	.20	.01	.08	.94
Parent Reported ER	-.01	.01	-.14	-1.22	.23

Notes: *ER*= Emotion Regulation

The next test investigated whether parent reported child coping was associated with parent reported purchase conflict and used the same covariates noted above. The model was not significant, $F(3,75) = 0.72$, $p = .55$, $R^2 = .03$, with neither age ($\beta = .01$, $p = 0.95$) or linguistic competence ($\beta = .03$, $p = 0.85$) predicting conflict. In addition, parent reported child coping was not significantly correlated with purchase conflict ($\beta = .16$, $p = 0.15$) although there was a trend suggesting that children who had more difficulty coping fought with their parents more.

Table 27. *Multiple Regression Predicting Parent Reported Purchase Conflict by Parent Reported Child Coping*

	B	SE	β	t	p
Constant	8.81	1.29		6.84	.001
Child age	.06	.85	.01	.07	.95
Linguistic competence	.04	.20	.03	.19	.85
Parent Reported Child Coping	.37	.26	.16	1.44	.15

The third test of emotion regulation and purchase conflict used the child observations from when they received both the desired and the non-desired gift. Similar to the test for parent reported emotion regulation and purchase conflict, this test used child age and child linguistic competence as control variables (which, as noted above were not significant predictors of purchase conflict). The complete regression model was not significant ($F(4,65) = 1.18$, $p = .38$, $R^2 = .07$). However, the addition of the dependent variables did indeed reveal that children's observed reaction to the desired gift significantly predicted parent reported purchase conflict ($\beta = .26$, $p < 0.05$) as children who exhibited more joy with receiving the desired gift were more likely to argue about purchases with their parents. Children's reaction to the non-desired gift was not significantly related to parent reported purchase conflict ($\beta = -.01$, $p = 0.92$).

Table 28. *Multiple Regression Predicting Parent Reported Purchase Conflict by Child Observed Emotion Regulation*

	B	SE	B	t	p
Constant	4.57	3.16		1.48	.15
Child age	-.03	.86	-.01	-.03	.98
Linguistic competence	.07	.20	.05	.32	.75
Child Observed ER-Desired gift	1.65	.77	.26	2.14	.04
Child Observed ER-Non-desired gift	-.05	.51	-.01	-.11	.92

Notes: *ER*= Emotion Regulation

Discussion

Over the past 40 years, research on children's understanding of commercial messages and how they respond to these messages has tried to explain why younger children are less likely to understand these messages and are more likely to respond favorably to them. Early research on the subject (e.g., Ward, Wackman, & Wartella, 1977; Rossiter & Robertson, 1974) theorized that children's understanding and reception of commercial messages were connected to their age without stipulating any strict developmental mechanisms to describe why children became savvier consumers of persuasive messages. Recently, however, theorists have suggested that there are identifiable developmental mechanisms to explain how children react to advertisements that are linked to children's neurological development (Moses & Baldwin, 2005, Rozendaal, Lapierre, Buijzen, van Reijmersdal, 2011). These researchers have hypothesized that the maturation of children's prefrontal cortex and the increased cognitive abilities that are associated with the maturation with this part of the brain predicts children's understanding of persuasive messages and their reception of these messages. These recent attempts to identify specific developmental mechanisms and their neurological correlates have made considerable steps to advance the field.

The current study extended this growing area of research by empirically testing whether children's developing theory of mind, executive function, and emotion regulation helps to bolster their reaction to advertisements and their understanding of commercial messages. With a sample of 79 children between the ages of 6 to 9 and their parents, this study sought to determine if these developmental mechanisms were linked to processing of advertisements and understanding of commercial intent. Moreover, the

current study tested whether these aspects of cognitive and affective development explain children's understanding of and reaction to advertisements above and beyond age and cognitive ability as earlier researchers have proposed (e.g., Chernin, 2007; Kunkel et al., 2004). In the following few pages, I will review the findings from the current study, describe how they extend to previous research, and offer reasons why the findings noted here do not fully support the hypothesized relationships.

Theory of Mind Development and Understanding of Persuasive and Selling Intent

The first set of hypotheses explored whether children's theory of mind development was linked to their understanding of advertising's persuasive and/or selling intent. Moreover, these hypotheses proposed that children's developing theory of mind capabilities would predict persuasion understanding over child age or child linguistic ability as previous scholars have found that age (Kunkel et al., 2004) and linguistic ability (Chernin, 2007) both predicted persuasion understanding.

The current study found that while theory of mind development did not predict children's knowledge of persuasive intent (H1b) it did predict children's understanding of advertiser's selling intent (H1a). Specifically, the better children performed on measures of theory of mind the more likely they were to know that commercial messages are designed to encourage the audience to purchase consumer goods (or encourage them to ask their parents). In addition, this link between theory of mind and knowledge of selling intent held even when accounting for child age and linguistic ability. This finding supports the theorizing of Moses and Baldwin (2005) as they predicted that children's theory of mind was a key element of understanding of commercial communication above and beyond other proposed determinants of persuasion understanding.

What is interesting about the relationship between theory of mind development and knowledge of selling intent is that the relationship only held for those theory of mind tasks that were more cognitive in nature rather than communicative. These cognitive tests for theory of mind explored whether children were able to consider the knowledge states of other people (i.e., did Bobby know that Sally thought x instead of y) while the communicative tests looked at whether children were able to discern the actual intent of a message rather than the literal interpretation of the message (i.e., Bobby actually meant x when he said y to Sally). What makes this finding so interesting is that it should have worked in the complete opposite direction. Understanding that a message is designed to sell you a product would rightfully seem analogous to understanding that someone is feigning bravery or expressing sarcasm as they each get at deconstructing the intended purpose of the message. Yet, the current study found that it was children's ability to understand knowledge states which was the primary predictive force for increased understanding of selling intent.

As such, the results from the current study suggest that understanding selling intent may have more to do with general cognitive sophistication rather than communicative sophistication in children. This finding actually matches up with previous research on theory of mind capabilities and social competency. For example, previous research with preschool children has shown that children who perform better on measures of false belief understanding were significantly more likely to understand social complexities even after controlling for language abilities and age (Astington & Jenkins, 1995). With this in mind, rather than being able to disentangle communicative appearance from communicative reality, perhaps the skill children need most in their

consumer understanding 'toolkit' is the ability to understand that other people have differing cognitive states than they do.

That said, it could also be the case that children's performance on these cognitive measures and the subsequent link to knowledge of selling intent is a byproduct of general cognitive performance. As other researchers have noted, increased performance on the types of theory of mind tasks used in the current study may depend on children's growing working memory capacity (Davis & Pratt, 1995). However, this explanation is unlikely as additional tests looking at performance on the working memory task predicting knowledge of selling intent (while simultaneously controlling for age and linguistic ability) did not show any link between working memory performance and knowledge of selling intent. It is likely then that consumer competence in children is not simply a specific cognitive ability (as measured by working memory) or general cognitive ability (as measured by linguistic competence) in disguise. Instead, the ability of children to keep in mind various cognitive states seems to be an important and independent determinant of consumer understanding.

With the findings related to theory of mind and understanding of selling intent working as predicted, it is interesting that children's theory of mind was not similarly linked to their subsequent understanding of *persuasive* intent. In trying to understand why this divergence in results was found, it may be due to differences in complexity between the two constructs. In the current study, knowledge of persuasive intent was defined as knowledge that commercials were designed to get viewers to like the product, while knowledge of selling intent was defined as knowledge that commercials were designed to get people to buy the product. In looking at the conceptual differences between the two

consumer competencies, it certainly seems that knowledge of selling intent would be a simpler concept to understand when compared to knowledge of persuasive intent. Knowing that commercials just want viewers to buy the things they are selling requires the ability to understand that someone else has separate yet definitive communicative intentions whereas knowing that commercials are designed to engender favorable thoughts would likely require the knowledge that others want to change your mental states.

The notion that these skills differ in complexity has been suggested by other scholars. As Kunkel (2010) has noted, it is likely that knowledge of selling intent is the first stage in a multistage process of consumer understanding for children while knowledge of persuasive intent it likely to come later in a child's development. His review of studies assessing knowledge of selling intent and persuasive intent have indeed found that these competencies do not arrive at equal times. This was precisely what was found in the current study, as seen in the results for RQ1, which tested whether there were any differences between children's knowledge of selling intent and knowledge of persuasive intent, children scored significantly higher on the measure of selling intent then they did on the measure of persuasive intent suggesting that former competency preceded the latter.

In fact, when looking at the collected evidence, Kunkel concludes that children likely need to be much older (ages 12-14) before they are consistently able to understand the true intent of persuasive messages. With this in mind, the lack of findings in the current study linking theory of mind to knowledge of persuasive intent are possibly due to two issues. The first of these issues is that the children in this study were too young to

consistently and reliably capture more complex understandings of consumer messages. The second of these issues is that the theory of mind tasks were not complex enough to capture the more nuanced cognitive competencies required to fully understand knowledge of persuasive intent. Future research that explores the role that theory of mind competencies play in predicting consumer understanding should look at incorporating older children as well as theory of mind measures that are significantly more complex.

Finally, one of the more interesting results from these hypotheses tests is the lack of influence age and linguistic competence played in predicting knowledge of selling and persuasive intent. As noted previously, much of the earlier theorizing on knowledge of advertiser intent used age as the likely determinant for when children were capable of understanding these messages (see Kunkel et al., 2004). However, later research by Chernin (2007) suggested that it was not age that was the primary driver of consumer understanding but rather it was general linguistic ability that predicted understanding as she proposed that persuasion/selling knowledge is primarily a test of how verbally sophisticated children are as children who perform better on these measures are just more articulate than children who do not. Her findings did indeed show that linguistic competence was a significant predictor of persuasion understanding and this relationship held when controlling for the age of the child.

Yet, in the tests conducted for the current study, neither of these variables explained a significant amount of variance after the inclusion of the theory of mind variables into the respective models. Instead, the results from the current suggest that past research on age and linguistic competence and their potential influence on children's understanding of commercial messages were looking in the wrong direction. It is not age

that predicts consumer understanding, but age, as a reliable predictor of cognitive development, works through theory of mind which then predicts consumer understanding. In addition, contrary to what Chernin proposed, the findings here suggest it is not the child's ability to competently communicate that leads to consumer understanding but is likely explained by the link between cognitive ability and language skill. However, more research is needed to further unpack how each of these variables interact as none of the variables investigated here predicted knowledge of persuasive intent.

Executive Function, Persuasion Susceptibility, and Consumer Behavior

Perhaps the most difficult set of findings to unpack are the ones looking at the role executive function played in shaping children's reactions to persuasive communication and this is for a number of reasons. Moreover, because of the number of hypothesis tests performed, these findings should be interpreted with significant caution. The first of these reasons is the number of variables used to explore the relationship between executive function and consumer behavior. With regard to the variables measuring children's executive function, two sets of measures were used; one based on parent report and the other based on direct assessment with the children. As noted earlier, the measures from the parents and the observations of the children were not consistently correlated with one another, yet each set of measures have been reliably used by other researchers with similar study populations so it was decided to use both parent and child measures. In addition, the child measures of executive function relied on a number of separate observations; there were reaction time based tests on computer, tests of working memory, and tests looking at the number of errors made on these separate tests.

Second, in addition to the numerous variables used to measure children's executive function, there were a number of dependent variables assessed with children participating in the study. While parents were only asked about the consumer goods their children asked for, the assessments with children looked at a few consumer behaviors. In the first assessment, children were asked how much they would like for one of their parents to purchase the products that they would later be exposed to in the second assessment and they were asked to select which of the stimulus products they would like to purchase. In the second assessment, children watched an episode of *SpongeBob SquarePants* and were given cereal to eat while they watched. Two measures of advertising susceptibility were used based on cereal consumption, the first measure was the amount of stimulus cereal children ate over the control cereal and the second measure was which cereal chose to eat immediately after watching an advertisement. After viewing the show with embedded advertisements, children were asked the same questions about product selection that they were asked at the first assessment.

Lastly, there were likely problems with the manipulation that were not apparent in the pre-test. Children did respond favorably to these advertisements and products in the pre-test, but these initial responses did not carry over to the main study. As noted above, children watched an episode of *SpongeBob SquarePants* with two sets of stimulus advertisements embedded in the episode. Unfortunately, in looking at the results from the manipulation check, it does not appear that the advertisements were successful in changing children's desire for the advertised products as children, regardless of their respective level of executive function capability, were not more likely to like or choose these products after exposure to the commercials. In addition, it appears that children

liked the Trix cereal more than Froot Loops after eating the cereals during the viewing as children in both conditions were more likely to choose Trix at the end of the assessment and ate more of this cereal.

With these issues in mind, two of the tests looking at executive function and persuasion susceptibility did indicate that there was a substantive link between executive function and parent reported purchase requests. The first of these was the link between parent report of executive function and parent report of purchase requests. After controlling for children's age and linguistic competence, parents who reported that their child had higher scores on the measure of executive function (in the measure used, higher scores meant less robust executive function) were more likely to ask their parents for consumer goods. The second of these was the link between the percent of mistakes children made on the tests of executive function and parent reported purchase requests, although this finding was only marginally significant.

To be clear, these two findings were in the minority when compared to those tests that did not demonstrate a significant relationship between children's executive function and their respective susceptibility to persuasive appeals. However, in looking at why these tests did not successfully show a relationship, it may have more to do with problems related to methodology and less to do with a lack of a relationship. As noted above, the manipulation used to cue persuasive effects was likely not effective in changing children's minds which rendered many of these tests useless. As such, the lack of a clear relationship when using the experimentally based tests was likely based on problems with this manipulation.

In comparison, the measures which detected significant effects for persuasion susceptibility and executive function did not depend on the advertising manipulation. The tests linking parent report of executive function and children's observed errors on the tests of executive function to parent reported purchase requests have been used in a number of studies (e.g., purchase requests: Buijzen & Valkenburg, 2003; Lapierre 2011; executive function: Hirschtritt et al., 2009; Simonds et al., 2007). As such, the significant relations found in these two tests are likely a more accurate reflection of how children's developing executive function is connected to their consumer behavior particularly the finding linking child observed executive function and parent reported purchase requests as this finding cut across observation types and did not solely rely on parental report. With a larger sample size and a more effective persuasion manipulation it could be possible to better determine if these relationships are indeed present.

Nevertheless, these results do indicate that children who are unable to consistently and competently control cognition are less likely to control their consumer impulses and are more likely to want consumer goods. As predicted by Moses and Baldwin (2005), these children with less control over their cognition respond more favorably to consumer cues and express desire for these goods above and beyond the effects of age and general cognitive ability (as indicated by linguistic competence). As such, these findings suggest that this particular aspect of cognitive development, rather than age as was previously hypothesized (e.g., Kunkel et al., 2004), is a considerable part of consumer behavior and is a necessary part of building persuasive defenses.

While caution is warranted when interpreting these results due to the possibility that they were due to chance, this set of findings could have significant implications

regarding how children are sold to in the United States. For decades, researchers and child advocates have suggested that supplying children with interventions that build advertising defenses would help support children's abilities to resist persuasive entreaties (see Livingstone & Helsper, 2006). Yet, the current study shows that children are more likely to ask for consumer goods based in no small part on their own cognitive maturation as executive function capabilities are linked to the development and growth of the prefrontal cortex (Welsh & Pennington, 1991). As theorized in the current study and previous work by the author (Rozendaal et al., 2011), the children with less robust executive function are less able to stop from asking their caregivers to purchase consumer goods and it is difficult to see how this particular skill can be taught via intervention. Instead, a more appropriate way to bolster children's defenses may be to increase negative emotions towards persuasive appeals (e.g., Buijzen, 2007).

However, these findings are limited to how executive function impacts children's abilities to subdue purchase desires; they do not tell us how children do in the moment with persuasive appeals. It was predicted that because of immature executive functioning, children would be easily ensnared by the frenetic formal features in advertisements and would be more likely to judge these advertisements favorably thereby becoming more likely to want the product. This particular set of predictions regarding persuasion processing was not supported, but it is uncertain why this was the case. It may be that this relationship simply does not exist and that children's executive function is not connected to how they process persuasive messages. Although, with the problems noted earlier regarding the failure of the commercial messages to cue persuasion effects, it may have been due to issues related to the ineffectiveness of the manipulation rather than an issue

between the two variables of interest. More research is needed to determine if this relationship does exist.

Lastly, there was a finding that went contrary to what was expected as children with more developed executive function, as measured by the parent, were more likely to say that they would like their parents to purchase the consumer goods shown in the first assessment. However, it was hypothesized that children with less developed executive function would be more likely to want the products. What makes this finding even more puzzling was that this was the one instance where either age or linguistic competence was a significant predictor of a consumer outcome even when accounting for a particular developmental variable, as younger children were more likely to report that they wanted their parents to buy these products. Considering the conceptual link between age and the development of executive function, this clear difference in how these variables performed was unexpected. One explanation may be that younger children who also evidenced less developed executive function were not as focused on the task and were therefore less invested in thinking about having their parents purchase these goods. Nevertheless, this a finding which definitely warrants more inquiry particularly since child observed executive function did not predict child reported purchase desire.

Emotion Regulation, Persuasion Susceptibility, and Parent/Child Arguments

The last of the constructs investigated was children's emotion regulation and its influence on their purchase requests, persuasion susceptibility, and parent-child conflict regarding refused purchase requests. Similar to the tests exploring the role executive function plays in shaping children's consumer behavior, the results looking at emotion regulation did not uniformly reveal a link between children's emotional development and

their consumer behavior. Part of the reason for this is likely due to the issues previously discussed with the manipulation as it was not strong enough to engender any persuasion effects.

The results do suggest that emotion regulation plays a role in shaping children's consumer behavior. First, the study did find that children's observed reaction to the gift task predicted parent-child consumer conflict and that this relationship held after accounting for child age and linguistic ability. Specifically, at the end of the first assessment, children were given the toy that they had earlier stated was their favorite and were then recorded while receiving the gift. The results revealed that children who expressed more positive reactions to this wanted gift (as opposed to the undesired gift) were significantly more likely to argue with parents about denied purchase requests. This finding suggests that children who are more likely to become emotionally engaged when encountering positively valenced stimuli are more likely to struggle with purchase refusals from their caretakers Although, this is not the only potential explanation which could explain this finding. For example, it may be that children who *really* like toys were more likely to get excited to receive the gift and are more likely to argue with their parents about toy (or other purchases). More research is needed to determine if this is an emotion regulation issue or an issue related to children's material connection to consumer goods.

Second, the parent measure looking at how their children were able to cope with situations that require their child to deal with exciting emotional situations (e.g., receiving a surprise or good news) significantly predicted parent reported purchase requests and there was a trend suggesting a link between child coping and parent reported

purchase conflict. What this study found was that children who had a more difficult time coping with exciting situations were more likely to ask their parents to purchase consumer goods and may be more likely to argue with their parents over purchase refusals.

This set of findings point to an interesting link between children's ability to cope with exciting situations and consumer behavior. The observational measure and the parent report measure both suggest that children who are less able to deal with excitement are more likely to ask their parents to purchase consumer goods and argue with them over purchases. Moreover, these results hold even after accounting for the role that age and children's linguistic competence play in shaping consumer behavior and emotion regulation.

Contrary to expectations, children's negative reactions to the gifts were not connected to consumer behavior. Specifically, children's reactions to the undesired gift in the second assessment (the undesired gift that was the one they liked the least when they were presented during the first assessment) did not predict purchase requests or parent-child conflict during purchase denials. The fact that these relationships did not exist with children's negative reactions to the undesired gift is somewhat surprising as children's negative behavioral and emotional reactions to parent's consumer decisions are frequently discussed in the literature (Atkin, 1978; Henry & Borzekowski, 2011). For example, Atkin's early work on parent-child consumer interactions only focused on how children's negative reactions led to parent and child disputes in the supermarket as children who expressed obvious disappointment with parent decisions escalated these disagreements. Yet, in this study, children's inability to cope with disappointing

situations did not appear to matter. The underlying reason for this lack of a finding may be connected to the age of the children in this study. The earlier research exploring children's tantrum behaviors and consumer interactions typically studied children in their pre-K to kindergarten years (Atkin, 1978; Henry & Borzekowski, 2011; Lapierre, 2012).

This difference in the age of the sample studied may explain why reactions to the positive stimuli were predictive of consumer behavior in this study and negative reactions were not. Expressing extreme negative reactions to disappointing information is typically more accepted with younger children while older children are expected to be better able to control their reactions to emotional situations as they reach their school years. Conversely, the ability to adequately control emotional reactions to positive experiences is still something that children are still learning while getting over-stimulated by these positive experiences are not as harshly judged by peers and caregivers. For example, in a longitudinal study conducted by Murphy and colleagues (1999), the researchers tracked children's displays of both positive and negative emotions from the preschool years to middle school. Reports from parents indicated a precipitous drop in the negative emotions displayed by children between the preschool and early elementary years yet after entering school, there was little change in children's displays of negative emotion (mean scores for negative emotionality: ages 4-6 = 4.01, ages 6-8 = 2.08, ages 8-10 = 1.97, ages 10-12 = 1.75).The researchers did not find, however, a similar change in displays of positive emotions as these remained consistently higher over the school years. In other words, a child in elementary school who behaves a little too 'hyper' or over-stimulated when excited is less likely to encounter condemnation from peers or caregivers than a child who exhibits tantrum behaviors when things do not go well.

With this difference in how differing emotional reactions are accepted by others in mind, the children participating in the current study may have been past the typical level of emotional development where the behaviors associated with extreme negative reactions are commonplace and more accepted. Perhaps if this study investigated children at preschool or kindergarten age (i.e., four to five year olds), the link between children's negative reactions to the undesired gift and parent-child purchase disagreements would have been stronger while children's reaction to the desired gift would have not been predictive of parent-child disagreement.

There were a couple of surprising results from the other tests of emotion regulation and consumer behavior. The first of these was the lack of a relationship between the other parent report of emotion regulation and any of the dependent measures. It is unclear why there were no observed relationships between this measure of emotion regulation and children's consumer behavior. The parent measure used for this study, (Emotion Regulation Checklist (ERC); Shields & Cicchetti, 1997), is regularly used to test children's emotional development and is recognized as a valid measure of emotion regulation in children. One potential reason for the lack of a significant finding is that the ERC assesses a separate aspect of emotion regulation.

The researchers who developed the measure primarily work in the field of developmental psychopathology and the instrument has been used to assess children whose difficulties to control emotions have negatively impacted their engagement with peers, family members, and other caregivers. As such, the measure used for the present study may not have been able to make the necessary differentiations in children's emotional development to clearly demarcate children who lagged in emotion regulation

versus those who were able to capably control their emotions. However, the descriptive statistics from the measure used do not indicate that there were noticeable restrictions in variance which would have limited the ability to find effects.

Secondly, similar to the difference in measurement between the parent and child measures for executive function, this parent measure of emotion regulation was not significantly correlated with the observational measures of emotion regulation. However, when looking at the three primary measures of emotion regulation, the measure of children's positive coping behaviors was correlated with both the Emotion Regulation Checklist and the observational measure (although these were only marginally correlated) indicating that there was some overlap between the measures indicating that these measures were uncovering something important as it relates to emotional development.

Lastly, it is interesting to note that none of the emotion regulation measures were linked to either age or children's linguistic competence. In past research, children's performance on similar measures has been correlated with age and general cognitive ability (Carlson & Wang, 2007). Yet, in the current study, there was no indication that these measures of emotional development were connected to these typical stand-ins for development.

Why the same pattern of findings did not occur in the current study is unclear. One explanation may be that children's ability to control their emotions in the early elementary school years progresses more slowly than with children in the preschool and kindergarten years. For example, Carlson and Wang's study (2007) found that age was a significant and comparatively strong ($r = .43$) predictor of emotion regulation in their sample of children between the ages of 4 to 5 (48 to 71 months). Conversely, Simonds et

al., (2007) did not find as strong effects for age on emotion regulation with a sample of 7 to 10 year-olds. This may be because the preschool and kindergarten years are a time of rapid emotional development for children when compared to the early elementary years. Due to both rapid neurological maturation and the demands of acclimating to the social pressures associated with attending school, a child just entering preschool or kindergarten must get used to the scheduling demands that school requires along with matching the behavioral standards of the school setting. For example, while it may be entirely permissible for a child in a daycare or home care setting to move from activity to activity or experience a tantrum when upset with a caregiver, those same behaviors are not allowed in a school setting. By the time a child reaches the first, second, or third grade, that child is well acclimated to the social and emotional demands of the school day, with the influence of age and general cognitive ability playing less of a role in determining emotional development (see Diamond & Aspinwall, 2003). As such, the correlation between age/general cognitive ability and emotion regulation is largely dependent on when exactly it is measured.

Age, Cognitive Ability, and Consumer Behavior

In each of the tests regarding how cognitive and emotional development influence children's consumer behavior, the effects of age and linguistic competence were simultaneously accounted for. However, as noted previously, much of the research on children's consumer behavior has traditionally used these variables as the primary predictor of those behaviors, particularly child age (child age: Kunkel et al., 2004; linguistic competence: Chernin, 2007). With this in mind, it is necessary to consider how

these two variables performed when predicting consumer behavior after accounting for specific aspects of cognitive and emotional development.

With regard to children's knowledge of selling and persuasive intent, neither age nor children's linguistic competence were significant predictors of advertising knowledge when accounting for the influence of children's theory of mind understanding. Yet, both age and children's linguistic competence were significantly correlated to performance on the theory of mind tasks. As it relates to children's knowledge of selling intent, this set of findings suggests that child age and linguistic competence act through children's theory of mind abilities. As such, previous research that has found a link between child age or linguistic competence and advertising knowledge may have been accounting for developmental differences associated with theory of mind knowledge rather than capturing something unique regarding age or language abilities. More research exploring the link between both age and cognitive ability on advertising knowledge when accounting for relevant developmental variables is definitely warranted.

Next is the role that age and linguistic competence play in shaping children's advertising susceptibility. While linguistic competence has typically not been a variable associated with children's purchase desire or consumer behavior, child age has often been associated with children's consumer behavior with younger children more likely to ask parents for consumer goods (Valkenburg & Cantor, 2001). In the current study, after accounting for the influence of either executive function or emotion regulation (depending on the specific test), child age only showed up as a marginally significant predictor in one test. Specifically, when looking at children's reported purchase desire; younger children were more likely to say that they wanted their parents to purchase the

products shown to them. Incidentally, this was the one hypothesis test which ran completely counter to what was expected when predicting parent-reported executive function influence on consumer behavior (i.e., children with better developed executive function (as observed by parents) was linked to child reported purchase desire).

As noted above, determining why this finding occurred, relative to executive function, demands further inquiry. However, what is important in this instance is to understand why age influenced purchase desire in this particular case, yet did not in any of the other tests. It is interesting to note that there was an independent effect for age on purchase desire and that it was roughly equal in magnitude to the effect that executive function had on the same consumer behavior. This finding suggests that there is likely something else related to age that is driving the relationship which was not assessed in the current study.

With regard to the tests that relied on the experimental manipulation, there is little available to determine why there was no relationship, as the manipulation did not succeed in changing children's attitudes towards the products. On the other tests of consumer behavior, however, the results did reveal that the effects of both age and linguistic competence were insignificant when accounting for both parent-reported and child observed executive function. Yet, similar to the effect found with theory of mind, the initial relationship between both age and linguistic competence and their respective effect on consumer behavior were marginally significant and significant, respectively (parent reported purchase requests: child age- $r(79) = -.16$, $p < .08$, linguistic competence- $r(79) = -.24$, $p < .05$). Thus, the effect that both of these variables have on consumer behavior is likely accounted for by differences in children's cognitive control as measured by

executive function. As such, future research on children's consumer behavior should look beyond age or general cognitive ability as a predictor of consumer behavior and should likely focus on the role that specific aspects of cognitive development play.

The last relationship to examine is the role that age and linguistic competence play in shaping children's reactions to purchase refusals from parents. In this particular instance, neither of these variables were initially linked to parent-child conflict over purchase denials (child age: $r(79) = .02$, $p = .44$; linguistic competence: $r(79) = .03$, $p = .39$) nor were they significant predictors of purchase conflict when accounting for emotion regulation. As noted above, this finding should not come as too great a surprise as neither age nor linguistic competence were significant predictors for performance on any of the measures of emotion regulation.

When comparing the results of age and linguistic competence versus the developmental variables of interest on the dependent variables, an interesting pattern emerges. While the developmental variables of interest were not uniformly predictive of the dependent variables, this study did find that theory of mind predicted knowledge of selling intent, children's executive function predicted parent reported purchase requests, and children's emotion regulation was linked to parent reported purchase conflict. When looking at age and linguistic competence, there was only one instance when either of these was an independent (though marginally significant) predictor for one of the dependent variables, as age was negatively correlated with child reported purchase desire. This difference in the results between these two classes of variables suggests that, as predicted, the role that cognitive and affective development play in influencing children's consumer behavior is important and are more powerful predictors than either age or

linguistic competence. As such, while more work is definitely needed to determine the exact role that these developmental variables play in shaping children's consumer behavior, evidence from the current study suggests that these developmental variables can help researchers understand how children understand and process consumer information and their explanatory power is greater than two variables that have been traditionally used to understand children's consumer behavior.

Implications

One clear implication that emerges from the current study is the role that developmental variables can play in helping children and media researchers understand how children process persuasive messages. While researchers have theorized that these developmental variables might influence children's ability to understand and respond to persuasive messages (Moses & Baldwin, 2005; Rozendaal et al., 2012), few studies have ever empirically tested whether there is a link between these variables and consumer behavior (with the recent exception of McAlister and Cornwell (2010) who have tested how executive function and theory of mind influence consumer behavior with preschool age children). The current study shows that these variables can help researchers understand how children develop as consumers and future research should include these or similar developmental variables to help uncover key linkages between cognitive and affective development to consumer behavior.

In regards to the practical implications associated with the observed links between cognitive and affective development and consumer knowledge/behavior, the results of the current study offer some important insights regarding the potential efficacy of interventions designed to bolster children's advertising defenses. A number of children

and advertising scholars have suggested that teaching children about the intended purpose of advertising can help them defend against commercial messages thus lessening their influence on young audiences (e.g., Eagle, 2007), while others have pointed out that these interventions rarely have their intended effect (Livingstone & Helsper, 2006). The results of the current study call into question whether these types of interventions are likely to succeed. Specifically, what appears to prevent children from understanding the purpose of persuasive messages is largely dependent on their own cognitive maturation and has less to do with a factual understanding of advertising messages. Children with less developed theory of mind are unable to make the necessary cognitive representations to adequately consider what a commercial message is trying to do.

Aside from the role that theory of mind development plays in determining the efficacy of child-based interventions, it is also necessary to consider how differences in children's executive function influence could render these interventions ineffective. The logic underlying these interventions is that once children understand why advertising is shown on television, they will then be able to resist their appeal. As noted above, the results of the current study call into question whether children are able to understand these messages but it is equally important to consider whether we can guarantee that children would be able to resist these messages even if they did understand their purpose. As the results of this study suggest, when looking at both parent report and child observed executive function, children's likelihood to ask their parents for consumer goods is negatively associated with the development of executive function (i.e., children lower in executive function ask their parents for more things), indicating that the desire to have parents purchase consumer goods is something quite separate from just

understanding that advertisements want people to buy things and cueing child skepticism. Moreover, this inclination towards buying more consumer goods is not based on an easily identifiable variable such as age, as previous scholars have identified the age of eight to be a key determinant in persuasion refusals (Kunkel et al., 2004). Rather, it appears to be connected to underlying cognitive mechanisms that are somewhat harder to conceptually pin down.

With these two considerations in mind regarding how both theory of mind and executive function may undermine consumer based interventions with children, it is important to consider whether anything can or should be done to help children contend with persuasive messages. This study provides initial evidence that it is not until children have the necessary cognitive competencies in place via theory of mind that they can understand that commercial messages are designed to encourage purchasing behavior. As such, it may not be a fair fight when pitting young audiences against sophisticated marketing appeals as children do not understand the stated purpose of these messages. In addition, because of the added problems associated with the development of executive function and consumer behavior, children who are lagging in their cognitive development are likely to engage in increased pestering of their parents regarding consumer goods. These children with lower executive function represent an easy target for advertisers as they are more likely to do their bidding with little ability to cognitively control these responses.

One way to help children contend with these commercial messages and the subsequent consumer behavior that follows from exposure would be to simply limit the number of messages that children see. The most recent estimates of children's exposure

to television commercials indicate that the average child sees between 14,000 to 30,000 advertisements in the course of a year (Gantz et al., 2007), and this does not account for the messages that children see online, in video games, or in the course of the average day (e.g., outdoor advertising). For example, a number of similar industrialized Western nations limit the ability of marketers to reach children (e.g., the United Kingdom, Denmark), while other countries forbid the practice of advertising to children entirely (e.g., Sweden, Norway; Mallalieu, Palan & Laczniak, 2005). However, it is unlikely that policy makers in the United States would take such steps as previous attempts to limit the advertising industry's ability to sell to children has been met with limited success (Kunkel et al., 2004). Other strategies to limit children's exposure to advertising could center on changing viewing patterns in the home by encouraging both children and parents to reduce screen time. Previous attempts to limit viewing time in children have been successful and have even been shown to positively impact child health outcomes (Epstein et al., 2008; Robinson, 1999). However, attempts to change child viewing behaviors in the long term are likely to be quite complicated and are not guaranteed to succeed (Jordan, Hersey, McDivitt, & Heitzler, 2006).

Another way to help children bolster their defenses against persuasive messages would be to employ consumer based interventions which target children's emotional reactions to commercial messages. Rather than trying to teach children about the purpose of advertisements and then hoping that this knowledge will cue children's skepticism about the appeal, these interventions attempt to generate negative attitudes about advertising which then leads to fewer purchase requests. Research by Buijzen (2007), suggests that these types of interventions are successful in reducing purchase requests and

are actually more successful than interventions that seek to improve advertising knowledge. Specifically, Buijzen had research assistants say negative things about advertisements while they were being shown to children and then tested whether these comments changed their behavior relative to children who did not receive the intervention. She found that children in the intervention were less likely to like the products and were less likely to request the products. Future research should determine whether the developmental variables under investigation in the current study may play a role in explaining this relationship. For example, it may be that children who are less able to regulate emotion are more likely to have these comments influence their later assessments as they are less able to control how these emotionally framed comments influence their thoughts.

The results from this study also establishes links to research currently being conducted on persuasion processing with adults and could potentially inform how adults contend with persuasive messages and consumer decisions. Specifically, research conducted by Falk and colleagues (see Berkman, Falk, & Lieberman, 2012; Falk, Berkman, Whalen, & Lieberman, 2011) have revealed that many of the same constructs under investigation in the current study (e.g., inhibitory control, impulsivity) influence how adults process and respond to persuasive messages as adults who struggle with inhibitory control and impulsivity are more likely to be persuaded by messages. Knowing that children with less developed executive function are more likely to ask parents for consumer goods, we can see how this could extend into the child's adult years as persuasion susceptibility and favorable attitudes towards consumer goods is based, in part, on cognitive functioning and neurological maturation. Additional work is needed to

precisely determine how persuasion processing and susceptibility change as children reach their adolescent and adult years.

Limitations and Future Research

There are a couple limitations with the current study that must be addressed and by addressing them, I hope to illustrate some future areas of inquiry regarding children and their ability to understand, process, and respond to persuasive messages. One issue that hampered this study was the small sample size. With approximately 80 children and their parents participating, this study's ability to detect significant effects was limited. Unfortunately, this researcher encountered a number of obstacles when trying to recruit both childcare programs/schools and parents to participate. Schools that had been contacted to participate in the study typically declined because data collection sessions were viewed as too disruptive to the school day while afterschool programs usually declined because of space and resource limitations. In addition, when permission was eventually secured from a day camp/afterschool program, there was a low response rate from parents even after numerous and varied attempts to recruit participants[7].

Considering the problems associated with studying child audiences encountered here[8], another way to investigate children's consumer behavior and development would

[7] Researchers made numerous attempts to speak with parents along with employing different strategies to recruit participants (e.g., flyers sent home to parents, articles in the program newsletter). In addition, data collections took place during the height of the Penn State child molestation scandal which, according to parent feedback, was a noted barrier to participation.

[8] An additional problem to consider is how the consent process works in the United States when compared to institutions in other countries. For example, in the Netherlands, which is home to one of the marque children and media research institutions- the Center of Research on Children, Adolescents, and the Media at the University of Amsterdam, parents must indicate that they *do not* want their children to participate in research

be to focus solely on what parents have to say about their children via a parent survey. While this survey would not have the same capability to directly test children's reactions to commercials and their development, by collecting data with a larger sample of parents there would be the opportunity to get a clearer view of how these differing variables interact and would offer potential avenues of future inquiry with children.

The second significant limitation was the failure of the advertising manipulation to sufficiently change children's attitudes and behaviors towards the consumer products. As has been discussed previously, the hope was that children's exposure to one set of advertisements would make them view the products more favorably when compared to products that they had not been exposed to. Unfortunately, this does not appear to be the case as the manipulation was unsuccessful in influencing children's consumption or desire for the products that they saw advertised.

In terms of understanding why these particular advertisements did not have the desired effect, it may be due to a number of factors. For one, there may have been too few (or too many) exposures to the commercial messages. Previous research by Belch (1982) had shown that while persuasion effects increased for children after one exposure to an advertisement, there was an obvious point of diminishing returns for message exposure as children expressed displeasure with seeing the same advertisement more than three times over an hour. In the current study, children saw each of the advertisements twice in the course of the 12 minute viewing exercise and there was a concern that showing the same advertisement more than twice would generate these same effects.

(Buijzen, personal communication). Otherwise, it is left up to the child to decide if they want to take part.

The second factor that may have led to the ineffectiveness of the manipulation could have been the nature of the advertisements shown. Appendix A offers a more robust discussion as to why these particular advertisements were selected, but a review of earlier research indicated that, absent the budget or ability to create professional quality commercials, using currently airing advertisements for products that were available to children offered the best chance to generate persuasion effects. However, this decision was based on a rather small number of studies as comparatively few studies have explicitly tested children's reactions to persuasive messages.

In addition, because of the significant difficulty encountered in recruiting childcare programs and children, the selected advertisements may have gone 'stale'. Specifically, by the time data collection was finished, a year had passed between when these commercials were selected and when children were assigned to view them. In fact, early analysis with the first twenty children enrolled in the study did indicate that the manipulations were successful in altering children's behavior and attitudes regarding the consumer products, although these findings could have been due to outliers in this small sample[9].

With an increased policy and research focus on children's reaction to persuasive messages, particularly as it relates to dietary behavior, more research is definitely needed to understand how researchers can generate clear persuasion effects with children. As it stands now, the current state of research looking into the impact of televised messages on persuasion outcomes is limited and quite outdated. It is essential to understand if certain

[9] There were approximately 2 months separating the data collections with the day camp and the afterschool program.

message formats (e.g., live action vs. animated), product types (e.g., cereal vs. snack), number of exposures, date of creation, or child's initial familiarity with the product/advertisement are most likely to change children's attitudes or behaviors. As such, if it were possible to consistently and effectively generate persuasion effects with televised messages, the ability of researchers to understand how children respond to advertising would be greatly improved and could likely impact policy regarding children and advertising.

Conclusion

Over the last few decades, research and theorizing regarding children's reactions to advertising have worked within a developmental framework that is likely outdated (Moses & Baldwin, 2005). While recent theorizing has attempted to update how researchers study the influence of development on children's consumer understanding and behavior (Harris, Brownell, & Bargh, 2009; Moses & Baldwin, 2005; Rozendaal et al., 2011; Wright, Friestad, & Boush, 2005), few attempts have been made to actually empirically test these new approaches to this area (McAlister & Cornwell, 2010). The current study represents one of the few comprehensive attempts to test whether these newer ways of understanding children's affective and cognitive development shape children's consumer understanding and behavior.

While the results do not uniformly show that the constructs under consideration influence consumer based outcomes, there is evidence that theory of mind development affects knowledge of selling intent, child executive function influences parent reported purchase requests, and emotion regulation is linked consumer based parent-child conflict. Moreover, these variables were able to predict child consumer development while also

accounting for other variables that have been typically viewed as chief predictors for these consumer outcomes, child age and linguistic ability. This study represents an important first step in helping to refine our theorizing on children and persuasion and sheds light on ways that parents, researchers, and policy advocates can help children negotiate the consumer landscape.

Appendices

Appendix A: *Pre-test to Select Stimulus Advertisements*

In order to test persuasion differences for children based on key developmental variables, this study used an experimental manipulation featuring different persuasive messages for children. The strategy used an A-B stimulus approach for testing persuasion effects. Specifically, approximately half of the children in the study were randomly exposed to one set of advertisements (A), while the other half were randomly exposed to another set of persuasive messages (B). During their exposure to one of the stimulus advertisements, children's consumption behavior was observed by the researchers. While after exposure to the stimulus advertisements, children's consumption behavior, attitudes toward the products, and purchase desire were observed for both sets of products A and B. As such, children exposed to the group A advertisements rather than the group B advertisements served as control group for children who were exposed to the group B advertisements and vice versa. With that in mind, it was necessary to find products and advertisements that were very similar to one another.

The goal was to use pairs of product that were not only in the same product class (cereal, gender neutral toy, snack) but shared as many of the same qualities as possible (e.g., citrus flavored non-carbonated sports drink, fruit flavored cereal, salty crunchy snack). In addition, the advertisements for these products had to be as similar to one another as possible with the same pacing and same appeal types (use of characters, use of humor appeals). Lastly, with the decision made that at least one measurement would focus on children's consumption of the associated products, it meant that one of the

stimuli products had to be a food product and one that almost all children would be able to eat (e.g., products could not be made with any peanuts or peanut products).

With these already acknowledge constraints on product type and advertisement type in place, another study was conducted to select two sets of matching stimulus advertisements for the main study. The goal of this study was to find advertisements that would likely persuade children and closely aligned with the form and content that children would likely be exposed to during their normal everyday lives. However, there is no universally applied methodology for testing persuasion effects in children.

In past studies, researchers have used a number of different stimuli to test persuasion effects in children. These stimuli have ranged from posters (Rexha, Mizerski & Mizerski, 2009), professional advertisements from other English speaking countries featuring products that were unfamiliar with children (Chernin, 2008), advertisements created specifically for the study (Macklin, 1994), advertisements shown on storyboards (Bakir, Blodgett, & Rose, 2008), commercials that had aired years previously (Buijzen, 2007; Chernin, 2008; Dawson, Jeffrey, Peterson, Sommers, and Wilson, 1985), magazine advertisements (Bakir & Palan, 2010), advergames on computer (Mallinckrodt & Mizerski, 2007), advertisement recollection (Buijzen & Valkenburg, 2003), and advertisements that were currently airing on television (Brucks, Armstrong, & Goldberg, 1988; Gorn & Goldberg, 1982; Wilson & Weiss, 1992).

Each of these methodologies has drawbacks and benefits, the goal with the current study was to find advertisements that would be most likely to produce the greatest persuasion effects in children. In addition, because this study posits that television advertisements have a unique effect on children, due to the commonly used formal

features and the affective cues, the decision was made to only consider studies that had used television advertisements. Based on these decisions and as I describe below, the strategy employed for the current study was to use professionally produced television advertisements that were currently/recently in circulation with products that were already likely known to the children.

Child Persuasion Studies and Advertisement Types

Unfamiliar Advertisements for Unfamiliar Products

Studies that have used advertisements which are unfamiliar to their child audiences have employed separate strategies, the first is to use advertisements for unfamiliar products that are currently in use in other parts of the country or in countries that have the same language and similar accents (Chernin, 2008), the second is to use professionally made advertisements that have been out of circulation for some time (Buijzen, 2007; Chernin, 2008), and the third is to use advertisements that were produced specifically for the study either by advertising professionals (Roedder, Sternthal, & Calder, 1983) or by the researchers (Macklin, 1994).

Foreign or Regional Advertisements

The first of these methodological approaches presents some interesting benefits. For one, because these advertisements are professionally produced, they are likely to avoid cuing children's skepticism about the product and may convince children to like and/or purchase the advertised product. Second, because the advertisements are currently in use (or recently in use), this type of commercial stimulus will likely feature the same formal features and advertising techniques that children are probably seeing in current advertisements.

One potential problem with this strategy, particularly with using advertisements that are airing in other areas of the country, is that it is difficult to identify children's products that are in use in other parts of the country that are strictly focused on marketing to young children. The one notable instance of this pattern is regional fast food restaurants; as there are popular restaurant chains in the Western and Southeastern parts of the United States (e.g., Jack in the Box, Carl's Jr., Bojangles, Cook Out) that have not yet penetrated the Mid-Atlantic/Northeastern market, which would mean that advertisements for these business would offer something new and unique to children. None of these regional chains appear to have advertising campaigns in place that solely target young consumers with perhaps the closest being the fast food restaurant Jack in the Box who uses the eponymous trade character Jack in most of their commercials. Yet, this character seems to appeal directly to adults, as many of the advertisements that feature Jack do not resemble commercials targeted to children (e.g., frenetic editing, excited children in the background) and feature adult based humor (e.g. satirical take on American culture and American corporate culture).

Using advertisements from other countries that are likely unknown to children may avoid some of the issues associated with using regional commercials, yet also presents new challenges. As opposed to the regional commercials, it is quite likely that one could identify products and advertisements that are targeted to young consumers. For example, Chernin (2007) was able to use advertisements and products from Canada that were geared towards child consumers in her study looking at child development and persuasion. However, while it is possible to find these advertisements, it is not clear that these cross-cultural advertisements would be effective. Chernin did not find robust

persuasion effects for the advertisements coming from across the border and this may be due to differing consumer sensibilities in these two countries.

For example, in a cross-cultural study with parents and children, Lapierre (2012) compared parent-reported consumer behaviors in the United States and Canada among young children and found significant differences between children living in these two nations. Specifically, children in the Canadian sample asked for considerably fewer consumer goods from parents and were much less likely to argue with parents over purchases. In addition, while both countries rely on the advertising industry to regulate itself (with the exception of the province of Quebec, which does not allow advertising to children), the Canadian advertising industry polices itself more stringently and allows fewer tactics than its American counterparts allow (Lapierre, 2012). For example, advertisements in Canada do not feature attractive trade characters (Chuck E. Cheese, Ronald McDonald) as part of campaigns and limit the claims advertisers can make regarding their products with a careful eye on over-exaggerating the benefits associated with using products. As such, advertisements in Canada may not be aggressive enough for children used to American style advertisements and the tactics that routinely accompany these commercials.

Advertisements No Longer Airing for Products That are No Longer Available

The second methodological approach for using unfamiliar advertisements would be to use commercials that were used at some point in the relatively distant past for products that are no longer available in stores. While this is not a widely used approach, there are a handful of researchers who have tried to create persuasion effects in this way. For example, in Chernin's (2007) study, the author used a commercial for the product

Sprinkle Spangles that was a cereal sold in the early-to-middle 1990s and was taken off supermarket shelves in 1995.

There are two clear concerns associated with using this approach with children. The most obvious issue is that it would mean using products and advertisements that were unmistakable failures. Now, to be clear, understanding why a product failed to gain traction with its target audience many years ago is not easily done. The product may have failed for any number of reasons that are not connected to the quality of the advertisements or the perceived worthiness of the product. Nevertheless, it does not seem wise to use a product or advertisements that were not able to generate interest from children and families.

The second problem with using significantly older advertisements (and their associated products) is connected to the likely production quality of older advertisements versus advertisements that children are now likely to see. While acknowledging that there are no empirical examinations testing the relative persuasiveness of children's advertisements based on the year they were produced, it seems quite likely that advertisements produced before most of the children in the present study were born will not be as persuasive as more current advertisements would be. For instance, it is likely that the clothes, hair, slang, and music used in these older advertisements will be inconsistent with current fashions and could trigger skepticism in the viewer. Second, the production values associated with significantly older advertisements are likely to be significantly different from the most current advertisements available for viewers and may likely seem less sophisticated to children participating in the study.

Creating Advertisements and Products for Main Study

The last of the possible methods for using unfamiliar advertisements with children in the current study would be to create advertisements specifically for this study. Yet, while this approach would offer the most control over what children would see, the possibility of using advertisements created specifically for this study was simply not possible. First, having commercials professionally made was not economically feasible, as it would have required considerably more money than what was available, particularly if the goal is to show children advertisements that closely approximate the kinds of commercials that children are likely to see when viewing television at home. Second, using researcher created advertisements for this study, while not likely requiring the same level of financial resources that the professional advertisements would demand, would also have been prohibitively expensive. Moreover, creating such commercials for this study would likely have required a skill set that this researcher does currently possess.

More importantly, it is not clear whether such advertisements would likely prove to be persuasive with children participating in the study. Due to the limited time with each of the children and the need to complete other activities associated with children's data collections, it is unlikely that children would have enough exposure to the stimulus commercials for these advertisements to 1) firmly establish knowledge of the products and 2) allow children to form opinions of the advertised goods. As such, it is questionable whether children would have had enough exposures to establish strong opinions regarding these newly created products.

Advertisements for Commercially Available Products

The other available option was to use advertisements for products that are still commercially available for children. With this methodology, there are three possible types of commercials/products to use. The first was to use advertisements that aired many years ago for products that are still sold in stores, the second was to use advertisements that have recently aired but are not currently in circulation, and the third was to use advertisements that were currently airing.

Advertisements Not Currently Airing

The first of these approaches would include using advertisements that were on air many years in the past. For example, Chernin (2007) used commercials that were on air in the relatively distant past for products that were still available for children to purchase. In the case of her study, this product was the orange powdered drink *Tang* which has been available in supermarkets since the middle part of last century. In the case of using a product like Tang, it is important to note that even though *Tang* may be available for purchase, it is not clear whether the product is currently being marketed to children via television advertisements (this author cannot recall seeing any *Tang* advertisements airing in association with children's programs and there are no English language advertisements available via any video websites).

The problem with using these types of advertisements is that it does not resolve the problem stated above regarding using older advertisements for products that are no longer commercially available. As noted above, advertisements that have been out of use for a number of years are likely to contain certain message features (e.g., music) and fashions that will seem anachronistic to children in the study and will likely not generate

strong persuasion effects. That said, there is no empirical work showing that these advertisements are less persuasive than more contemporary advertisements, although if there were no difference in persuasiveness based on the age of the commercial then we would likely see commercial "re-runs" instead of new advertisements every few months.

The other option would be to use advertisements that have recently stopped airing on television but have associated products that are currently commercially available. This option of using advertisements that have recently been taken off the air for products that are still available in stores is an intriguing one. First, these advertisements would most likely not look dated to children since they have been produced quite recently. Second, since these products are still available for purchase, there is clear evidence that these products and advertisements would appeal to children. However, there is a potential drawback to using these advertisements, as they are likely not any different from using advertisements that are currently in use. With advertisements that have recently stopped airing, it is likely that these commercial appeals will be just as familiar to children participating in the study or maybe even more familiar. As such, it is quite possible that no real benefit would be gained from using these kinds of advertisements for the main study.

The last option would be to use advertisements that are currently airing for products that are still commercially available. Of all the potential approaches raised, ranging from using unknown products from either foreign countries or different regions in the United States to using advertisements for currently available products that have just recently stopped airing, using advertisements that are currently in use is most likely the best strategy to use (although, with unlimited financial resources, the best option would

be to create new advertisements and new products, but that option was not available). First, previous studies that have used advertisements that were currently airing have shown consistent persuasion effects with children (e.g., Brucks, Armstrong, & Goldberg, 1992, Gorn & Goldberg, 1982). Perhaps the most well-known of these studies is the Gorn and Goldberg (1982) examination of persuasion effects on children's consumer choices. In this study, set at a summer camp, groups of children were assigned to view a cartoon program with varying types of advertisements or no advertisements over a two week period. One group of children saw advertisements for candy, another group of children saw public service announcements encouraging healthy eating, while another group served as the control condition. The study found that children exposed to the contemporaneous candy advertisements were more likely to select candy in the summer camp store and were less likely to select healthy products. Conversely, children in the PSA condition were more likely to select healthy products.

Another advantage to using advertisements that are currently airing is that these commercials will represent the latest set of appeals and most current appeal types that children are likely to routinely see. For example, one of the potential problems with using significantly older advertisements is the likelihood that these advertisements will seem anachronistic to children and will be less persuasive, since the advertisements used for this study are current, this problem will be avoided.

The one major drawback associated with using current advertisements is that children may be put off by advertisements that they have likely seen a few times prior to exposure during data collection. Specifically, they may have already made up their minds about the commercials and will be resistant to any persuasive effects. However, this

approach must be judged against the other potential approaches. For one, using advertisements for products that are initially unknown to children would mean using products that 1) are from other regions of the country or from outside of the country, 2) have been out of the marketplace in a relatively long time, or 3) created specifically for the study. Second, using advertisements that are known to children but are not airing currently would mean using products and advertisements that have either been off the air for a considerable length of time or have just been taken off air.

As noted previously, the problem with using advertisements that are foreign to children in the study is that these advertisements may likely reflect different cultural standards while advertisements that come from different regions of the United States would likely not produce enough advertisements that are geared towards young audiences. Using older advertisements for products that are either no longer available or still commercially available for purchase is a less optimal approach since these products failed to thrive in the first place and would require using advertisements that are many years old with antiquated message features. Third, using researcher created commercial messages would be prohibitively expensive to produce professionally made persuasive messages or, if created by non-professionals, these messages will likely not be able to match the sophisticated appeals children are typically exposed to. Lastly, using advertisements for commercially available products that have just recently stopped airing is essentially not any different from using advertisements that are currently airing.

With each of these unique issues with different message approaches in mind, using currently airing advertisements is the best of all options and the next step was to find advertisements to use with children that meet the conditions stated above. First, the

pairs of products/advertisements need to be similar to one another. The advertisements must have similar formal features and use the same appeal types while the products need to be similar with regard to product type (e.g., cereal, snack, gender-neutral toy), and these products must be similar with regard to their qualities (e.g., if cereal ads are chosen for the stimulus advertisements, the cereals should be similar according to type). Due to an earlier decision regarding methodology, two sets of ads were sought for the main study. Lastly, one of the pairs of products also had to be something that almost all children could eat (i.e., made without nuts or other powerful allergens), since two of the dependent measures explored how much of the advertised products children consumed.

Methods

Research Design

This study utilized a structured interview format to understand children's attitudes towards the advertisements. Children met with the primary researcher to view television advertisements and answer questions about the ads that they saw. Children were asked to speak honestly and were told that there were no wrong answers regarding what they thought about the advertisements.

Participants

Study Sample. Families were recruited via snowball sampling. First, an email was sent to parents asking if they had children between the ages of 6 to 8 years. Second, after children met with the researcher to discuss advertisements, their parents were asked if they knew of any other children were eligible to participate. Parents who said that they knew of other families that might be interested in participating were asked to forward along information about participating in the study. In all, 14 children participated in the

study. The average age of participants was approximately 7.1 years and there were 8 boys and six girls who participated in the study.

Procedures

After obtaining approval from the Institutional Review Board at the University of Pennsylvania, a small study was conducted to find appropriate commercial messages for the main study. After recruiting children and parents to participate, families came to the university to meet with the researcher (in one instance, the researcher went to a family's home to meet with children). Before data collection started, the research sat down with parents and children to explain the purpose of the study, go over the consent form, and answer any questions that families had about the study. Once the consent form was signed and all of the family's questions were answered, parents were asked to leave the data collection session (parents were free to stay if either they or their child was uncomfortable with sitting alone with the researcher, although no children or parents expressed any misgivings about the child staying with the researcher) and the data collection began.

At the start of the session, children were told that they were going to watch twenty advertisements and would then be asked what they thought about the commercials they would be seeing. The children were then told that there were no right or wrong answers and they were free to say whatever they wanted regarding the commercials. After answering any questions that children had or addressing concerns, the commercial viewing began. Once children were finished watching the commercials they were given a small toy and $10 as compensation for participating.

Stimuli

The twenty advertisements were taken from children's television networks (e.g., Nickelodeon, Cartoon Network) airing in December of 2010. The following advertisements were used in the pretest (product name, product type, and time): Lucky Charms, cereal, 30 seconds; Froot Loops, cereal, 30 seconds; Trix, cereal, 30 seconds; Honey Nut Cheerios, cereal, 30 seconds; Corn Pops, cereal, 30 seconds; Chuck E. Cheese, restaurant, 30 seconds; McDonalds, restaurant, 30 seconds; D'animals Coolision, yogurt snack, 30 seconds; Yoplait Splitz, yogurt snack, 30 seconds; Hex Bug Antz, electronic toy, 30 seconds; Paper Jamz, electronic toy, 30 seconds; Cookie Crisp, cereal, 15 seconds; Reese's Puffs, cereal, 15 seconds; Cocoa Puffs, cereal, 15 seconds; Cinnamon Toast Crunch, cereal, 15 seconds; Trix Yogurt, yogurt snack, 15 seconds; Yoplait Splitz, yogurt snack, 15 snack; Yoplait Go Gurt, yogurt snack, 15 seconds; Paper Jamz, electronic toy, 15 seconds; and Hex Bug Nano, electronic toy, 15 seconds.

Measures

Product Knowledge. After viewing the individual advertisements, children were asked if they knew what product was being shown to them in the commercial. Children who correctly answered what the product was

Product Liking. Children were asked how much they liked the product that was advertised to them. The question about how much children liked the product was answered on a three point scale (0 = I do not like this product, 1 = it's okay, 2 = I like this product). After answering this question, children were then asked why they liked the product with an open-ended response.

Advertisement Liking. Following the questions regarding how much children liked the product advertised, they were then asked about the actual advertisement. First, children were asked how much they liked the advertisement and were able to respond a three point scale (0 = I do not like this product, 1 = it's okay, 2 = I like this product). Second, children were then asked why they liked or did not like the advertisement. With this second question children were able to answer with an open-ended response.

At the end of the viewing session, children were asked to recall the advertisements that were their favorites and the advertisements that they liked the least. Children were free to name as many advertisements as possible as their favorites. Likewise, children were free to name as many advertisements as possible as their least favorites.

Results/Discussion

Table 28 shows the advertisements seen, the time of the advertisement and the average liking for each advertisement.

Table 29. *Brand, Product Type, Time and Liking for Each Product and Advertisement*

Brand Name	**Product Type**	**Advertisement Time**	**Advertisement Liking**	**Product Liking**
Cookie Crisp	Cereal	15	2.00	1.21
Reese's Puffs	Cereal	15	1.36	1.29
Cocoa Puffs	Cereal	15	1.86	1.36
Cinnamon Toast Crunch	Cereal	15	2.00	1.36

Brand Name	**Product Type**	**Advertisement Time**	**Advertisement Liking**	**Product Liking**
Trix Yogurt	Yogurt Snack	15	1.50	1.21
Yoplait Splitz (1)	Yogurt Snack	15	1.71	1.36
Yoplait Go Gurt	Yogurt Snack	15	1.71	1.71
Paper Jamz (1)	Electronic Toy	15	1.71	1.07
Hex Bug Nano	Electronic Toy	15	1.71	1.57
Lucky Charms	Cereal	30	1.79	1.36
Honey Nut Cheerios	Cereal	30	1.86	1.57
Trix	Cereal	30	1.79	1.57
Froot Loops	Cereal	30	1.93	1.71
Corn Pops	Cereal	30	1.86	1.86
Chuck E. Cheese	Restaurant	30	1.43	1.71
McDonalds	Restaurant	30	2.00	1.79
D'animals Yogurt	Yogurt Snack	30	1.71	1.29
Yoplait Splitz (2)	Yogurt Snack	30	2.00	1.29

Brand Name	Product Type	Advertisement Time	Advertisement Liking	Product Liking
Paper Jamz (2)	Electronic Toy	30	2.00	1.07
Hex Bug Antz	Electronic Toy	30	2.00	1.71

As noted earlier, the goal of this study was to find advertisements for the main study that were matched along advertisement length, product type, and advertisement liking. Second, because one of the products used for the main study would be consumed by children participating in the study, at least one food product must be included in the final slate of advertisements and the food product should be something that most children are able to eat (e.g., products that likely contain nuts).

The first set of advertisements to select were the ones that would be used in the taste test during the main study. A number of products were excluded because children would not be able to eat them (i.e., toys). The products that were removed because children could not eat them were the toys and the fast-food restaurants. The toy advertisements that were removed were the 15 and 30 second advertisements for Paper Jamz and Hex Bug Ants/Nano. The fast-food advertisements that were removed from consideration were the 30-second advertisements for McDonalds and Chuck E. Cheese.

Another set of products were removed due to the potential of food allergies with children. One set of these products were those that likely contained nuts. The first of these products was Reese's Puffs which is a chocolate and peanut butter flavored cereal and was removed due to concerns over peanut allergies and the second was Honey Nut Cheerios which is a honey and nut flavored cereal. An additional set of products were

removed from consideration because of concerns over lactose/ milk allergies. These were the yogurt snacks and included Yoplait Splitz, D'animals Coolision, and Yoplait Go Gurt (it was also unlikely that these products would have been suitable to serve to children because of refrigeration needs).

Of the products that remained, all of them were cereals and are separated by 15-second advertisements and 30-second advertisements. Of the 15-second advertisements that remained, one was removed from consideration because it did not taste similar to the other two. This cereal was Cinnamon Toast Crunch, which as the name suggests, is a cinnamon flavored cereal, while the other remaining cereals, Cocoa Puffs and Cookie Crisp, are chocolate and chocolate-chip cookie flavored cereals, respectively. While the product qualities were not exactly equivalent, these two remaining cereals were left for consideration as the products to be used for the taste test since the advertisements for these products were similar in format (they both showed their respective trade characters plotting to steal a taste of the cereal), formal features (fast cuts and rapid zooms), and advertisement liking was roughly similar.

Of the 30-second advertisements that were under initial consideration, the potential choices were General Mills' Lucky Charms (a toasted oat cereal with assorted marshmallow/confectionary bits), General Mills' Trix (a corn based, fruit flavored cereal), Kelloggs' Froot Loops (a corn and wheat based, fruit flavored cereal), and Kelloggs' Corn Pops (a sweetened corn puff based cereal). With the four remaining advertisements and products, one commercial was quite different from the other three. The commercial for Kelloggs' Corn Pops used stop-motion animation to show anthropomorphized Corn Pops lounging by a milk pool. The anthropomorphized pieces

of cereal did not speak during the commercial and the commercial was slowly paced when compared to the other commercials.

The three remaining cereals under consideration had advertisements that were all very similar to one another. The advertisement for Lucky Charms featured the animated eponymous character Lucky as he tried to keep his cereal from a group of children. The advertisement for Trix centered on the Trix Rabbit trying to take cereal from some unsuspecting children and was discovered only after losing control and get discovered by the children. The last of these advertisements was the one for Froot Loops and featured the character Toucan Sam with his three young nephews. The narrative for the commercial focused on Toucan Sam and his associates trying to take Froot Loops cereal from an abominable snowman and succeeding. In addition, all of the commercials featured the same pacing/editing as one another and were all animated.

Considering that each of these advertisements were very similar to one another, the factor that ultimately determined which pair would be selected were the product qualities. Specifically, both Trix and Froot Loops are fruit flavored corn cereals that are nearly indistinguishable from each other. Conversely, Lucky Charms does not taste similar to either of the remaining cereals.

The two pairs of products under consideration, after eliminating products and advertisements that were either not possible to use or were not appropriate to use due to differences in product and/or advertisement qualities, were the 15 second commercials for Cookie Crisp and Cocoa Puffs and the 30 second commercials for Froot Loops and Trix. When considering which pair of advertisements and products to use, the factors

considered when making the choice were the similarity between advertisements, the similarity between the products, and the liking of the advertisement/product.

With regard to the similarity between the pairs of advertisements, both pairs were very similar to one another. They all featured animated advertisements with brand characters trying to acquire the product as part of the commercial plot and both pairs of advertisements used fast paced editing and "in your face" characters. However, the pairs of advertisements were different on two accounts. First, the product similarities between Trix and Froot Loops were greater than Cookie Crisp and Cocoa Puffs. Trix and Froot Loops are both corn-based cereals with assorted fruit taste while Cookie Crisp and Cocoa Puffs are somewhat dissimilar. Cookie Crisp is a corn and rice based cereal while Cocoa Puffs is primarily corn-based cereal. More importantly, the taste of the two cereals is not the same as Cocoa Puffs is clearly a cereal that is chocolate flavored and Cookie Crisp is designed to taste like chocolate chip cookies. Second, when children were asked how much they liked each of these products, the two 15-second advertisements appeared to be liked less than the two products with the 30-second advertisements. With these considerations in mind, the commercials and products for Trix and Froot Loops were chosen to be the one pair of products to use as the stimuli advertisements that were also to be sampled by the children in the study.

With the products selected for the taste test stimulus advertisement, the next step was to find a pair of advertisements that would not be sampled by children. Considering that cereal products were chosen for the first advertisement, these product types were not included for selection as the second set of advertisements. By excluding the cereal advertisements, the products and advertisements remaining were the advertisements for

the electronic toys (both the 15 second and 30 second commercials), the yogurt snacks (both the 15 second and 30 second commercials), and the fast food restaurants.

The first product class to be discussed was the electronic toys (15 and 30 second versions of the Paper Jamz and Hex Bug advertisements). The advertisements for these products were quite different from one another (when compared to the other advertisements under consideration) both when looking at how much children liked the advertisements/products and the visual presentation of the advertisements. Regarding the liking of the advertisements and products, for both the 15 and 30 second versions of these advertisements, children reported that they liked the Hex Bug Antz and Hex Bug Nano commercials more than the Paper Jamz advertisements. Second, the structure of these advertisements were a bit different from one another. The Hex Bug Antz and Hex Bug Nano commercials featured a group of children playing with these small toys in a laboratory or science fiction setting (Hex Bugs are tiny toy robots that look like insects) with the advertisement featuring fast paced editing and quick zooms. On the other hand, both of the advertisements for Paper Jamz feature a single tween/teenager using the product (Paper Jamz are an electronic musical toy whereby flattened versions of musical instruments can be played by pressing buttons) in a less frenetic visual style. With these key differences in mind, the advertisements for these products were not considered for inclusion in the main study.

The next set of products and advertisements to be considered were the commercials for the restaurants (McDonalds and Chuck E. Cheese). The advertisement for Chuck E. Cheese was not unlike other advertisements that this restaurant airs during children's programming. Specifically, the commercial showed the character Chuck E.

Cheese gathering with children in one of his restaurant and arcade with the children in the advertisement clearly enjoying their time there. Moreover, like most other Chuck E. Cheese commercials, this advertisement was fast paced and prominently featured loud music and sound effects.

The advertisement for McDonalds shared some similarities with the advertisement for Chuck E. Cheese as this commercial featured the brand character, Ronald McDonald, playing with excited children. However, while the advertisement for Chuck E. Cheese could be described as 'in your face', the advertisement for McDonalds was somewhat more subdued. The advertisement centered on the character of Ronald McDonald along children playing on giant pogo sticks as they hop towards a McDonalds restaurant and had a slightly slower in pace than the Chuck E. Cheese commercial. In addition, the McDonalds advertisement did not have the same aural qualities as the Chuck E. Cheese commercial. Whereas the Chuck E. Cheese advertisement was loud and featured exciting music, the music in the McDonalds commercial was quieter in tone. In regards to children's reactions to these advertisements, they responded quite favorably to both of them. Children reported that they liked the McDonalds advertisement slightly more than the advertisement for Chuck E. Cheese, but the difference was minimal.

The last of the advertisements under consideration were the commercials for the yogurt snacks. These commercials were both 15 seconds in length and 30 seconds in length and included advertisements for General Mills' Trix Yogurt, Yoplait Splitz, D'animals Coolision, and Yoplait Go Gurt. The 15-second advertisements included the advertisements for Trix Yogurt, Yoplait Splitz, and Yoplait Go Gurt. The first of these commercials was for Trix Yogurt and featured the Trix Rabbit acting in ways that are

similar to the Trix cereal commercials. Specifically, the advertisement featured the Trix Rabbit on a spaceship trying to steal yogurt from another spaceship piloted by young children. The second of these advertisements was the advertisement for Yoplait Splitz. This advertisement was an abridged version of the 30-second advertisement and featured a child trying to hide from other neighborhood children as he tried to eat the yogurt snack. The last of the 15-second advertisements was for Yoplait Go Gurt, which is a drinkable yogurt. The advertisement featured animated characters as they competed for more of the yogurt snack.

The 15-second advertisements were quite similar to one another in regards to the auditory aspects of the commercial. The music in each of the advertisements was loud and all three advertisements used chaotic sound effects as part of the message, although the advertisement for Yoplait Splitz was somewhat louder than the other two commercials. However, the commercials were different along other dimensions. For example, the advertisements for Trix Yogurt and Yoplait Go Gurt were animated, while the advertisement for Yoplait Splitz was live action. The characters' reactions to the advertised product in the Yoplait Splitz commercial were also less subdued than the reactions found in the characters of the other advertisements in this category. Specifically, children were depicted as extremely excited to get the yogurt snack that the other child had while characters in the other commercials were certainly excited to be around the advertised product but did not display the same frenzy for the product.

In looking at how much children liked the particular advertisements/products, children reported being more favorable towards the Yoplait Go Gurt than the other two products. When considering the obvious differences in how much children liked this

product when compared to the other yogurt snacks and the differences in the presentation of this advertisement, the commercial for Yoplait Go Gurt was removed from consideration. This left the 15-second advertisements for Yoplait Splitz and Trix Yogurt as possible stimulus advertisements for the main study.

The two thirty second yogurt snack advertisements were for Yoplait Splitz and D'animals Coolision. As noted above, the advertisement for Yoplait Splitz was the extended version of the 15-second advertisement with the chief difference between the two advertisements being the extended chase scenes with the children. The advertisement for D'animals Coolision featured children dancing in a nightclub with the two stars from the Nickelodeon television show *The Suite Life with Zach and Cody* and also included an animated monkey that ate the yogurt snack. The advertisements were similar along a number of dimensions. First, the auditory aspects of the advertisements were similar in their presentation as both commercials were quite loud. The Yoplait Splitz commercial featured children yelling and the sounds of an ice cream truck while the D'animals Coolision advertisement included children chanting and club style music. Visually, the advertisements both used live action with only a short appearance from an animated character in the D'animals commercial. Both advertisements utilized frenetic editing techniques and were visually exciting. Lastly, children responded similarly to the advertisements as children indicated that they liked the advertisement/product at the same level. The major differences between the two advertisements were the underlying narratives as the Yoplait Splitz advertisement focused on children clamoring to get a product and the Danimals Coolision commercial featured children celebrating the

product. Nevertheless, these advertisements were similar enough to one another to be considered for the main study.

Three pairs of advertisements were left for consideration for the main study. These were the advertisements for Chuck E. Cheese and McDonalds, Yoplait Splitz and Trix Yogurt, and Yoplait Splitz and Danimals Coolision. The next step was to determine which of these pairs of products would be the most appropriate for the main study. The advertisements for the fast-food restaurants well liked by children and both used brand characters in their appeals. However, the advertisements for these two products were significantly different in the presentation of their appeals as the McDonalds advertisement was slower paced than the Chuck E. Cheese advertisement and did not match the excitement of this advertisement.

The second pair of advertisements were the 15-second advertisements for the yogurt snacks: Yoplait Splitz and Trix Yogurt. Of the three pairs of commercials to consider, these advertisements were the least similar to one another, although children responded equally favorably for these products. First, the Trix Yogurt advertisement was animated while the Yoplait Splitz commercial was live action. Second, the commercial was not equally matched on the auditory aspects of the advertisement with the Yoplait Splitz advertisement employing more sound effects and a louder presentation.

The last set of advertisements under consideration for the main study were for Yoplait Splitz and Danimals Coolision which were 30 seconds each. Of the three pairs of advertisements under consideration, these commercials were likely the most similar in presentation and in children's reactions to them. First, both advertisements primarily used live action formats with only the Danimals advertisements briefly featuring an animated

monkey. Second, both advertisements had similar auditory features with the Danimals Coolision advertisement relying heavily on dance club music with shouting children and the Yoplait Splitz commercial using the sounds from an ice cream truck and screaming children. Third, these two advertisements used editing techniques that contributed to the exciting nature of the ads including fast-paced cuts and rapid zooms. Lastly, according to the ratings from children, their reactions to the advertisements and the product were very similar.

Considering children's reactions to the three pairs of advertisements, the auditory features of the commercials, and the visual aspects, the pair of advertisements that would likely be the best for the main study are the 30-second ads for Yoplait Splitz and Danimals Coolision. Of the three pairs, they were the most visually similar, share the most auditory features, and were equally liked by children in this preliminary study. As such, Yoplait Splitz and Danimals Coolision will join the 30-second advertisements for Froot Loops and Trix cereals for inclusion in the main study.

Appendix B: *Demographic Breakdown of Total Sample and Between Conditions*

Table 30. *Demographic Breakdown of Total Sample and Between Conditions*

	Total Sample M (SD) or % (N)	**Froot Loops/D'animals Coolision M (SD) or % (N)**	**Trix/Yoplait Splitz M (SD) or % (N)**	
Gender (Female)	50.6% (40)	55.0% (22)	46.2% (18)	$\chi^2(1) = 0.62$
Age (Years)	7.70 (0.88)	7.73 (0.83)	7.66 (0.93)	$t(77) = 0.38$
Child had Special Needs	11.4% (9)	10.0% (4)	12.8% (5)	$\chi^2(1) = 0.16$
Family Size	3.77 (1.09)	3.90 (1.13)	3.64 (1.04)	$t(77) = 1.06$
Racial/Ethnic Background				
White	81.8% (63)	82.5% (33)	81.1% (30)	$\chi^2(1) = 0.03$
African American	2.6% (2)	5.0% (2)	0% (0)	$\chi^2(1) = 1.90$
Asian American	3.9% (3)	2.5% (1)	5.4% (2)	$\chi^2(1) = 0.43$
Multi-Racial	11.7% (9)	10.0% (4)	13.5% (5)	$\chi^2(1) = 0.23$
Mother Education				
Some High School	1.3% (1)	0% (0)	2.7% (1)	
High School Diploma	6.3% (5)	5.1% (2)	8.1% (3)	

	Total Sample M (SD) or % (N)	**Froot Loops/D'animals Coolision M (SD) or % (N)**	**Trix/Yoplait Splitz M (SD) or % (N)**	
Some college/Associate's degree	30.0% (24)	38.5% (15)	24.3% (9)	
Bachelor's degree	27.5% (22)	25.6% (10)	32.4% (12)	
Master's degree	26.3% (21)	28.2% (11)	27.0% (10)	
Ph.D., M.D., J.D.	3.8% (3)	2.6% (1)	5.4% (2)	
Missing				
Father Education				
Less than High School	1.3% (1)	0% (0)	2.9% (1)	
High School Diploma	23.8% (19)	29.7% (11)	22.9% (8)	
Some college/Associate's degree	28.8% (23)	27.0% (10)	37.1% (13)	
Bachelor's degree	21.3% (17)	27.0% (10)	20.0% (7)	
Master's degree or higher	10.0% (8)	8.1% (3)	14.3% (5)	

	Total Sample M (SD) or % (N)	**Froot Loops/D'animals Coolision M (SD) or % (N)**	**Trix/Yoplait Splitz M (SD) or % (N)**	
Ph.D., M.D., J.D.	5.0% (4)	8.1% (3)	2.9% (1)	
Missing				
Family Income				
Less than $15K	1.4% (1)	0.0% (0)	2.9% (1)	
$15 to 30K	8.2% (6)	10.5% (4)	5.7% (2)	
$30 to 45K	8.2% (6)	7.9% (3)	8.6% (3)	
$45 to 60K	5.5% (4)	2.6% (1)	8.6% (3)	
$60 to 75K	11.0% (8)	18.4% (7)	2.9% (1)	
$75 to 90K	8.2% (6)	5.3% (2)	11.4% (4)	
$90 to 105K	12.3% (9)	13.2% (5)	11.4% (4)	
More than $105K	45.2% (33)	42.1% (16)	48.6% (17)	
Child Qualifies for Free or Reduced Lunch				
No	84.0% (63)	82.1% (32)	86.1% (31)	$\chi^2(2) = 1.84$
Yes	9.3% (7)	7.7% (3)	11.1% (4)	
Don't know	6.7% (5)	10.3% (4)	2.8% (1)	

Appendix C. *Parent Measures*

Cognitive Development, Affective Development and Persuasion

Parent Questionnaire

Child's Name:	**Parent's Name:**
Child's Birthdate:	**Parent's Birthdate:**
Child's Gender:	**Today's Date:**

PLEASE ANSWER THE FOLLOWING QUESTIONS. AFTER COMPLETED, PLEASE RETURN TO US USING THE ENCLOSED ENVELOPE AND RETURN TO YOUR CHILD'S CAMP. ONCE WE RECEIVE THE QUESTIONNAIRE WE WILL SEND YOU $10.

THANK YOU!

Section 1: Your Child's Activities

1. Please circle how many **weekdays (Monday – Friday)** your child watches **television** (not videos or DVDs)
   Never 1 2 3 4 5
   How many **minutes per average day**? _____

2. Please circle how many **weekend days (Saturday – Sunday)** your child watches **television** (not videos or DVDs)
   Never 1 2
   How many **minutes per average day**? _____

3. How often is the television on in your home, even when no one is watching it?

   Do not own a TV Never Rarely Sometimes Often Almost always

Section 2: Media Access. Tell us about the number and kinds of media equipment you have or wish to buy in the boxes below.

	Do you have these in your <u>Child's Bedroom</u>? *Circle Response*	**How many are found in <u>other</u> parts of the home?** *Write Number*
Television	YES NO	
VCR	YES NO	
DVD	YES NO	
Radio	YES NO	
Computer	YES NO	
Game Boy/Nintendo DS	YES NO	
Video Game System	YES NO	
Internet Access	YES NO	

Section 3: Shopping Information Please answer the following questions to help describe shopping behavior with your child					
	Never	Rarely	Sometimes	Often	Almost Always
I ask my child for advice about buying things	N	R	S	O	A
I ask my child about things that I buy for myself	N	R	S	O	A
I let my child decide what things he/she should or should not buy	N	R	S	O	A
I ask my child what he/she thinks about things he/she buys for him/herself	N	R	S	O	A
When I go grocery shopping, I take my child	N	R	S	O	A
When I go general family shopping, I take my child	N	R	S	O	A
When I shop for my child, I take him/her along	N	R	S	O	A
My child and I talk about buying things	N	R	S	O	A
I ask my child his/her preference when I buy something for him/her	N	R	S	O	A
I talk to my child about where certain things can be bought	N	R	S	O	A

Section 4: Consumer Understanding **How much to you agree or disagree with the following statements, as they pertain to your child participating in this study?**					
	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
My child believes that almost all advertisements are true	SD	D	N	A	SA
My child can tell when an advertiser is exaggerating	SD	D	N	A	SA
My child understands that actors who endorse a product may not really use that product	SD	D	N	A	SA
My child understands that TV characters are just pretending or playing a role	SD	D	N	A	SA
My child has become concerned about what his/her friends will think if they buy a certain consumer product	SD	D	N	A	SA
My child has become concerned about what kinds of kids buy a certain consumer product	SD	D	N	A	SA
My child has become concerned about whether his/her purchasing of a consumer product will make a good impression on others.	SD	D	N	A	SA

Section 5: Purchase Requests								
	How often does your child **ask** you to purchase the following goods or services?				How often do you **argue** with your child about purchasing these goods or services?			
	Never	Rarely	Often	Always	Never	Rarely	Often	Always
Toys	N	R	O	A	N	R	O	A
CDs, DVDs or other media product	N	R	O	A	N	R	O	A
Candy	N	R	O	A	N	R	O	A
Computer games or video games	N	R	O	A	N	R	O	A
Clothes	N	R	O	A	N	R	O	A
Snack food	N	R	O	A	N	R	O	A
Fast-food restaurants (McDonalds, Taco Bell, etc.)	N	R	O	A	N	R	O	A
Non fast-food restaurants (Outback, Chuck E. Cheese, etc.)	N	R	O	A	N	R	O	A
Movies	N	R	O	A	N	R	O	A
Amusement parks (Six Flags, mini-golf, water parks, etc.)	N	R	O	A	N	R	O	A

Section 6: BRIEF Inventory Has your child had any problems with the following behaviors over the **past 6 months**. Please answer all the items the best you can.			
	Never	Sometimes	Often
Acts wilder or sillier than others in groups (birthday parties, recess)	N	S	O
Interrupts others	N	S	O
Gets out of seat at the wrong times	N	S	O
Gets out of control more than friends	N	S	O
Blurts things out	N	S	O
Acts too wild or 'out of control'	N	S	O
Has trouble putting the breaks on his/her actions	N	S	O
Gets in trouble if not supervised by an adult	N	S	O
Becomes too silly	N	S	O
Talks at the wrong time	N	S	O
Resists or has trouble accepting a different way to solve a problem with schoolwork, friends, chores, etc.	N	S	O
Becomes upset with new situations	N	S	O
Tries the same approach to a problem over and over even when it does not work	N	S	O
Acts upset by a change in plans	N	S	O
Resists change of routine, foods, places, etc.	N	S	O
Has trouble getting used to new situations (classes, groups friends)	N	S	O

Section 6: BRIEF Inventory- continued Has your child had any problems with the following behaviors over the **past 6 months**. Please answer all the items the best you can.			
	Never	Sometimes	Often
Thinks too much about the same topic	N	S	O
When given three things to do, remembers only the first or last	N	S	O
Has a short attention span	N	S	O
Has trouble concentrating on chores, schoolwork, etc.	N	S	O
Is easily distracted by noises, activity, sights, etc.	N	S	O
Has trouble with chores or tasks that have more than one step	N	S	O
Needs help from an adult to stay on task	N	S	O
Forgets what he/she was doing	N	S	O
When sent to do something, forgets what he/she is supposed to get	N	S	O
Has trouble finishing tasks (chores, homework)	N	S	O
Has trouble remembering things, even for a few minutes	N	S	O
Is disturbed by change of teacher or class	N	S	O

Section 7: Emotion Regulation Checklist For each question please indicate whether the statement is **never**, **sometimes, often**, or **almost always** true for your child participating in this study. There are no right or wrong answers.				
	Never	Sometimes	Often	Almost Always
Is a cheerful child.	N	S	O	A
Has wild mood swings (changes unexpectedly from a good to a bad mood).	N	S	O	A
Responds positively when adults approach him/her in a friendly or neutral way.	N	S	O	A
Moves easily from one activity to another; doesn't become angry, anxious, upset, or overly excited when changing activities.	N	S	O	A
Gets over it quickly when he/she is upset or unhappy (doesn't pout, remain sullen, anxious or sad after upsetting events	N	S	O	A
Is easily frustrated.	N	S	O	A
Responds positively when another child approaches him/her in a friendly or neutral way.	N	S	O	A
Is likely to have an angry outburst or easily throws tantrums.	N	S	O	A
Is able to wait for what he/she wants.	N	S	O	A
Seeing others unhappy gives him/her pleasure (e.g., laughs when someone gets hurt or punished, enjoys teasing others).	N	S	O	A
Can keep his/her excitement under control (e.g., doesn't get "carried away" in high-energy play situations or overly excited when it is not appropriate).	N	S	O	A

Section 7: Emotion Regulation Checklist- continued				
	Never	Sometimes	Often	Almost Always
Is whiny of clingy with adults.	N	S	O	A
Is likely to have outbursts of energy and exuberance (or excitement) that are disruptive.	N	S	O	A
Responds angrily when an adult sets limits.	N	S	O	A
Is able to say when he/she is feeling sad, angry or made, fearful or afraid.	N	S	O	A
Seems sad or without energy.	N	S	O	A
When your child tries to play with others, he/she is overly exuberant (overly-excited).	N	S	O	A
Seems unemotional (e.g., child's expression is vacant or inexpressive; child seems emotionally absent).	N	S	O	A
When another child attempts in a friendly or neutral way to get your child to play or join in, he/she responds negatively (e.g., may speak in angry tone of voice or respond fearfully).	N	S	O	A
Is impulsive; does things without thinking.	N	S	O	A
Shares in feelings of others; shows concern when others are upset or unhappy	N	S	O	A
Displays excitement or enthusiasm that upsets or intrudes on others.	N	S	O	A
When another child acts aggressively toward child, he/she reacts appropriately (e.g., expresses anger, fear, frustration distress but does not return aggression).	N	S	O	A
When your child tries to get others to play, he/she shows negative emotion (anger, fear, frustration, distress).	N	S	O	A

Section 9: Coping with Excitement Now we would like to know how your child does when he or she is in a very positive situation (just received a nice gift, wins a prize), how often does he or she…					
	Never	Rarely	Sometimes	Often	Always
Scream or shout for joy?	N	R	S	O	A
Become hard for you to control?	N	R	S	O	A
Take a long time to get back to 'normal' (normal being the mood he or she was in before the event)?	N	R	S	O	A
Display an excessive amount emotion, like crying or laughing hysterically?	N	R	S	O	A
Talk about the event for a long time afterwards?	N	R	S	O	A

Section 10: Family Information
Please answer the following questions to help describe your child and your family.

How many persons are living in your house?

_____ person(s) younger than 18

_____ person(s) 18 and older

<u>Language</u>

What is the main language spoken in your home? _____

What language do *you* most frequently speak with your CHILD? _____

What language does *your CHILD* most frequently speak with you? _____

If your CHILD had his/her choice, which language would he/she speak at home? _____

What language does your CHILD most frequently speak with his/her friends? _____

Does your child have an identified disability that interferes with his/her learning? If yes, please describe it.

❑ NO

❑ YES → If YES, _____

Section 10: Family Information (Continued)		
How would you describe …?		
Your Child	**Child's Mother / Mother Figure**	**Child's Father / Father Figure**
❑ Male ❑ Female	❑ Male ❑ Female	❑ Male ❑ Female
❑ White ❑ African American ❑ White Hispanic ❑ Black Hispanic ❑ Native American ❑ Other (please tell us): _____	❑ White ❑ African American ❑ White Hispanic ❑ Black Hispanic ❑ Native American ❑ Other (please tell us): _____	❑ White ❑ African American ❑ White Hispanic ❑ Black Hispanic ❑ Native American ❑ Other (please tell us): _____
What is your child's birth order? ❑ 1st ❑ 2nd ❑ 3rd ❑ 4th or later (please specify): _____	**How many years of education has the <u>Child's Mother / Mother Figure</u> completed?** _____ years	**How many years of education has the <u>Child's Father / Father Figure</u> completed?** _____ years

Section 11. Parent Education / Income / Employment	
Child's Mother / Mother Figure - Education	**Child's Father / Father Figure - Education**
What is the *HIGHEST* diploma or degree obtained by the Child's Mother / Mother Figure? ❑ None ❑ Less than 8th grade ❑ 8th grade ❑ Some High School ❑ High School/GED ❑ Some College ❑ Associate's Degree ❑ Vocational Degree or Trade School (e.g., beauty school) ❑ Bachelor's degree (e.g., B.S., B.A.) ❑ Master's Degree (e.g., M.S., M.A.) ❑ Ph.D., M.D., J.D., etc.	**What is the *HIGHEST* diploma or degree obtained by the Child's Father / Father Figure?** ❑ None ❑ Less than 8th grade ❑ 8th grade ❑ Some High School ❑ High School/GED ❑ Some College ❑ Associate's Degree ❑ Vocational Degree or Trade School (e.g., beauty school) ❑ Bachelor's degree (e.g., B.S., B.A.) ❑ Master's Degree (e.g., M.S., M.A.) ❑ Ph.D., M.D., J.D., etc.
Child's Mother / Mother Figure - Employment	**Child's Father / Father Figure - Employment**
What is the Child's Mother / Mother Figure current employment status (check all that apply)? ❑ Employed full time ❑ Employed part-time ❑ A homemaker ❑ Self-employed ❑ In Military ❑ A student ❑ Retired ❑ Unemployed ❑ Disabled ❑ Other (specify):_____ **If working, what is the Child's Mother / Mother Figure's job?** _____	**What is the Child's Father / Father Figure current employment status (check all that apply)?** ❑ Employed full time ❑ Employed part-time ❑ A homemaker ❑ Self-employed ❑ In Military ❑ A student ❑ Retired ❑ Unemployed ❑ Disabled ❑ Other (specify):_____ **If working, what is the Child's Father / Father Figure's job?** _____

Section 11. Parent Education / Income/ Employment	
What is your family's yearly net income (income after taxes)? ❑ Less than $15,000 ❑ $15,000 to 29,999 ❑ $30,000 to 44,999 ❑ $45,000 to 59,999 ❑ $60,000 to 74,999 ❑ $75,000 to 89,999 ❑ $90,000 to 104,999 ❑ More than $105,000	**Does your child qualify for free or reduced lunch?** ❑ No ❑ Yes ❑ Don't Know

Appendix D: *Child Measures*

Executive Function Testing

Introduction

[Introduction will be done orally by the assessor. The introduction will contain the following elements:

1) **Explain that the child will be playing a couple of games on the computer.**
2) **Explain that if the child wants to take a break at any time, they are free to do so.**
3) **Remind the child that we will not be keeping score so that the child can relax and try their best.**

[All materials in italics should be presented on screen. However, to help the children, assessors will read all of the instructions to the children.]

A. Demographics

[Programming Note: do not display heading, question numbers, or variable names (in bold)]

We would like to begin by finding out a couple of things about you.

A1. How old are you? **[open ended]**
AGE _____years

A2. Are you:
GENDER

Boy……..0
Girl……...1

B. Practice

Now we are going to play a few games on the computer. None of these games are being played for points; we just want to see how you respond to the things that we show you on screen. For this first game, we are going to show you squares that will appear all over this computer screen. Whenever you see a square, hit the spacebar.

[New screen]

Let's practice…remember whenever you see a square **[show square at bottom of screen]** *you will hit the spacebar.*

[Children will be given 8 practice opportunities to make sure that they understand the directions. For each practice trial, the assessor will initiate the trial by using the mouse. The square will then appear at these intervals, after the assessor has initiated the trial:

Practice Trial 1: 1.290s Six
Practice Trial 2: 1.091s Four
Practice Trial 3: 1.078s Three
Practice Trial 4: 1.622s Four
Practice Trial 5: 1.513s One
Practice Trial 6: 1.021s Seven

Practice Trial 7: 1.925s Six
Practice Trial 8: 1.598s One

The squares will appear all over the screen and will disappear when the child presses the spacebar. If the child does not hit the spacebar, the square will disappear after 2 seconds.]

Got it?

Now let's try some others!

[Same directions apply for this task as the practice trials.
Trial 1: 1.003 Four
Trial 2: 1.148 Four
Trial 3: 1.240 Two
Trial 4: 1.919 One
Trial 5: 1.530 Three
Trial 6: 1.318 Seven
Trial 7: 1.914 One
Trial 8: 1.734 Seven
Trial 9: 1.567 Seven
Trial 10: 1.856 Four
Trial 11: 1.667 Two
Trial 12: 1.855 Five
Trial 13: 1.565 Five
Trial 14: 1.862 Six
Trial 15: 1.460 Five
Trial 16: 1.412 Two
Trial 17: 1.730 Three
Trial 18: 1.985 Three
Trial 19: 1.060 Seven
Trial 20: 1.592] Four

C. Go-No-Go Test

The next game is "Leprechaun and Troll"

You are going to see either a Leprechaun or a Troll in the middle of the screen. When you see a leprechaun, you are going to press the spacebar as FAST as you can. However, if you see a troll, you do not press the spacebar at all.

[Show images of both the leprechaun and the troll at the bottom of the screen]

Let's practice.
[Children will be given 8 practice opportunities to make sure that they understand the directions. For each practice trial, the assessor will initiate the trial by using the mouse. The troll or leprechaun will then appear at these intervals, after the assessor has initiated the trials:
Practice Trial 1: 1.640- Troll

Practice Trial 2: 1.141- Leprechaun
Practice Trial 3: 1.696- Troll
Practice Trial 4: 1.473- Leprechaun
Practice Trial 5: 1.906- Leprechaun
Practice Trial 6: 1.001- Troll
Practice Trial 7: 1.090- Troll
Practice Trial 8: 1.486- Leprechaun

The figures will appear in the center of the screen and will disappear when the child presses the spacebar. If the child does not hit the spacebar, the figures will disappear after 2 seconds.]

Got it?

Here are some more!

[I am not sure if it is possible, but if the child does not understand the task, I would like the child to be able to redo the practice round]

Trial 1: 1.923 Leprechaun
Trial 2: 1.079 Troll
Trial 3: 1.225 Leprechaun
Trial 4: 1.813 Leprechaun
Trial 5: 1.656 Leprechaun
Trial 6: 1.086 Troll
Trial 7: 1.339 Leprechaun
Trial 8: 1.471 Troll
Trial 9: 1.874 Troll
Trial 10: 1.798 Leprechaun
Trial 11: 1.169 Leprechaun
Trial 12: 1.687 Troll
Trial 13: 1.595 Troll
Trial 14: 1.722 Leprechaun
Trial 15: 1.762 Leprechaun
Trial 16: 1.538 Leprechaun
Trial 17: 1.169 Troll
Trial 18: 1.770 Troll
Trial 19: 1.179 Troll
Trial 20: 1.392 Troll
Trial 21: 1.581 Troll
Trial 22: 1.346 Leprechaun
Trial 23: 1.180 Leprechaun
Trial 24: 1.885 Troll
Trial 25: 1.727 Leprechaun
Trial 26: 1.208 Leprechaun
Trial 27: 1.948 Leprechaun
Trial 28: 1.803 Troll
Trial 29: 1.577 Troll

Trial 30: 1.415 Troll
Trial 31: 1.995 Leprechaun
Trial 32: 1.497 Leprechaun
Trial 33: 1.883 Troll
Trial 34: 1.771 Leprechaun
Trial 35: 1.935 Troll
Trial 36: 1.504 Troll
Trial 37: 1.354 Troll
Trial 38: 1.486 Leprechaun
Trial 39: 1.848 Leprechaun
Trial 40: 1.346 Leprechaun

D. Flanker Test

You did a terrific job on that last game! Let's try another one!
This game is called 'Which way is the fish going?'
I am going to show you some pictures of fish, and you are going to tell me which way the fish in the center is swimming. If the fish is swimming to your left; you are going to press the 'A' button, if the fish is swimming to the right; you are going to press the 'K' button on the keyboard.
Let's practice some…
[Children will be given 8 practice opportunities to make sure that they understand the general directions. For each practice trial, the assessor will initiate the trial by using the mouse. The fish will then appear at these intervals (facing the direction noted), after the assessor has initiated the trials:

Practice Trial 1: 1.969 Left
Practice Trial 2: 1.616 Left
Practice Trial 3: 1.412 Right
Practice Trial 4: 1.589 Left
Practice Trial 5: 1.730 Right
Practice Trial 6: 1.790 Right
Practice Trial 7: 1.422 Left
Practice Trial 8: 1.737 Right

Throughout this task the fish will disappear when the child hits one of the correct buttons. If the child does not hit the correct button, the image will remain onscreen for 4 seconds.
Similar to the comment above, I would like (if possible) for repeats of the practice trials if the child does not understand the task.
After the child is done with the first part of the practice they will be told that there is more practice, but this time, there will be other fish on screen. The other fish will either be swimming with the focal fish or swimming in the opposite direction.

Practice Trial 9	**1.298**	**Left**	**Congruent**
Practice Trial 10	**1.368**	**Right**	**Incongruent**
Practice Trial 11	**1.087**	**Left**	**Incongruent**
Practice Trial 12	**1.944**	**Left**	**Incongruent**
Practice Trial 13	**1.027**	**Left**	**Congruent**

Practice Trial 14 1.522 Right Congruent
Practice Trial 15 1.984 Right Congruent
Practice Trial 16 1.646 Right Incongruent

If possible, I would like the option to repeat.]

Way to go!

Let's try some more!

Trial 1:	**1.636**	**Right**	**Congruent**	**Four Fish**
Trial 2:	**1.457**	**Left**	**Congruent**	**Four Fish**
Trial 3:	**1.412**	**Left**	**Incongruent**	**Six Fish**
Trial 4:	**1.018**	**Left**	**Congruent**	**Four Fish**
Trial 5:	**1.027**	**Left**	**Incongruent**	**Six Fish**
Trial 6:	**1.371**	**Left**	**Congruent**	**Four Fish**
Trial 7:	**1.046**	**Right**	**Incongruent**	**Six Fish**
Trial 8:	**1.405**	**Right**	**Incongruent**	**Two Fish**
Trial 9:	**1.640**	**Right**	**Congruent**	**Two Fish**
Trial 10:	**1.530**	**Left**	**Congruent**	**Two Fish**
Trial 11:	**1.901**	**Right**	**Incongruent**	**Four Fish**
Trial 12:	**1.798**	**Left**	**Congruent**	**Six Fish**
Trial 13:	**1.440**	**Right**	**Incongruent**	**Two Fish**
Trial 14:	**1.521**	**Left**	**Congruent**	**Four Fish**
Trial 15:	**1.151**	**Right**	**Incongruent**	**Six Fish**
Trial 16:	**1.149**	**Right**	**Congruent**	**Four Fish**
Trial 17:	**1.250**	**Left**	**Incongruent**	**Four Fish**
Trial 18:	**1.950**	**Right**	**Congruent**	**Four Fish**
Trial 19:	**1.400**	**Right**	**Congruent**	**Six Fish**
Trial 20:	**1.711**	**Right**	**Congruent**	**Four Fish**
Trial 21:	**1.806**	**Right**	**Incongruent**	**Four Fish**
Trial 22:	**1.651**	**Right**	**Incongruent**	**Four Fish**
Trial 23:	**1.143**	**Left**	**Incongruent**	**Two Fish**
Trial 24:	**1.738**	**Left**	**Incongruent**	**Four Fish**
Trial 25:	**1.390**	**Right**	**Incongruent**	**Four Fish**
Trial 26:	**1.188**	**Left**	**Incongruent**	**Two Fish**
Trial 27:	**1.535**	**Right**	**Incongruent**	**Six Fish**
Trial 28:	**1.679**	**Right**	**Incongruent**	**Six Fish**
Trial 29:	**1.944**	**Right**	**Congruent**	**Six Fish**
Trial 30:	**1.904**	**Left**	**Incongruent**	**Six Fish**
Trial 31:	**1.649**	**Right**	**Congruent**	**Two Fish**
Trial 32:	**1.424**	**Right**	**Incongruent**	**Two Fish**
Trial 33:	**1.553**	**Left**	**Congruent**	**Six Fish**
Trial 34:	**1.710**	**Left**	**Congruent**	**Two Fish**
Trial 35:	**1.263**	**Left**	**Incongruent**	**Four Fish**
Trial 36:	**1.971**	**Left**	**Incongruent**	**Two Fish**
Trial 37:	**1.301**	**Left**	**Congruent**	**Two Fish**
Trial 38:	**1.850**	**Left**	**Congruent**	**Six Fish**
Trial 39:	**1.956**	**Left**	**Incongruent**	**Two Fish**

Trial 40:	**1.120**	**Right**	**Congruent**	**Two Fish**
Trial 41:	**1.026**	**Left**	**Congruent**	**Two Fish**
Trial 42:	**1.205**	**Left**	**Incongruent**	**Four Fish**
Trial 43:	**1.752**	**Right**	**Congruent**	**Six Fish**
Trial 44:	**1.590**	**Right**	**Congruent**	**Two Fish**
Trial 45:	**1.164**	**Right**	**Incongruent**	**Two Fish**
Trial 46:	**1.385**	**Right**	**Congruent**	**Six Fish**
Trial 47:	**1.696**	**Left**	**Congruent**	**Six Fish**
Trial 48:	**1.231**	**Left**	**Incongruent**	**Six Fish**

Theory of Mind Assessment

First Order False Belief

Children see a puppet of a boy and girl, with a sheet of paper with a cabinet and a refrigerator drawn on it.

‘‘**Here’s Bobby and Sally. They are sharing a chocolate bar and want to save it for later. They both put the chocolate bar in the cabinet and leave the room**

(puppets are shown placing bar in cabinet and leaving scene).

However, Sally decides to come back and put the bar in the refrigerator and leaves the room.

(female puppet enters, puts the bar in the refrigerator and then leaves)

Bobby comes back to the kitchen to take a bite of the chocolate bar.’’

(male puppet enters)

1. ‘‘**Where will Bobby look for the chocolate bar? In the cabinet or in the refrigerator?**’’

2. ‘‘**Where is the chocolate bar really? In the cabinet or in the refrigerator?**’’

(Record responses)

Real Apparent Emotion

(Show child page with faces on it.) Initially, children see a sheet of paper with three faces drawn on it—a happy, a neutral, and a sad face.

This face means "sad" *[Point to face with frown]*

This face means" just okay" *[Point to face with straight mouth]*

And this face means "happy" *[Point to face with smile].*

Check to make sure the child knows what each means. Ask:

If you were sad, which face would you point to?

If you felt just okay, what face would you point to?

If you felt happy, what face would you point to?

If Child does not understand face scale, repeat what each face means one more time and then continue on to the task.

(Show child toy figure of boy, with his FACE TURNED AWAY.)

"This story is about a boy. I'm going to ask you about how the boy really feels inside and how he looks on his face. He might really feel one way inside but look different on his face. Or, he might really feel the same way inside as he looks on his face. I want you to tell me how he really feels inside and how he looks on his face."

"This story is about Matt. Matt's friends were playing together and telling jokes. One of the older children, Rosie, told a mean joke about Matt and everyone laughed. Everyone thought it was very funny, but *not* Matt. But, Matt didn't want the other children to see how he felt about the joke because they would call him a baby. So Matt tried to *hide how he felt*."

Give the child two memory checks:

1. **"What did the other children do when Rosie told a mean joke about Matt?**
2. **"In the story, what would the other children do if they knew how Matt felt?**

Point to the three emotion pictures, record responses

3. **"So, how did Matt really feel when everyone laughed? Did he feel happy, sad or okay?"**
4. **"How did Matt try to look on his face when everyone laughed? Did he look happy, sad, or okay?"**

(Record response)

Second Order False Belief

Children see a boy and girl puppet, with a paper cutout of a truck and pictures of a playground and beach.

"This is a story about Tom and his friend Mary. This is Tom and this is Mary. One day, Mary and Tom decide that they would like some ice cream from the ice cream truck at the playground"

(ice cream truck is shown in front of the playground)

"Tom needs to go home to get some money from his mom and tells Mary that he will meet her at the playground to get ice cream. When Tom gets home, his mom tells him that the truck is actually at the beach."

(adult puppet is shown with boy puppet)

"As Mary walks to the playground, she finds out that the ice cream truck is at the beach, and because she can't wait for ice cream she goes to the beach to get her ice cream.

(ice cream truck is shown at the beach)

Tom does not know that Mary knows where the ice cream truck is now."

1. **" Where does Tom think the ice cream truck is, at the playground or at the beach?"**
2. **"Where does Mary think the ice cream truck is, at the playground or at the beach?"**
3. **"Where does Tom think Mary will go for the ice cream"**

(Record responses)

Interpretive Theory of Mind

Children see two boy puppets, with a paper cutout of a basketball hoop.

"Robert is the new player on his school's basketball team. He is really excited about being on the team. Robert's best friend Oliver also plays on the team.

During his first game, Robert misses the chance to score several easy shots and his team loses the game. After the game, Oliver says to Robert: ''You sure are a GREAT scorer!''

1. **Did Robert help his team to win the game?**

2. **What did Oliver say to Robert?**

(Record response)

3. **Does Oliver mean that?**

4. **What does Oliver mean?**

5. **Does Oliver think Robert is a great scorer?**

(Record response)

REMEMBER TO KEEP THIS HIDDEN FROM CHILDREN

*We are going to play another game, I am going to read you some numbers and then I am going to ask you to read the numbers back to me. But with this game, you are going to read the numbers **backwards** and I am only going to read the numbers once. Let me show you-*

Read the numbers to the children with a rate of approximately one number per second. If the child asks you to repeat the numbers, please let them know that you cannot.

If I say the numbers- 7-1

Then you say- 1-7

If I say the numbers- 8-7-0

Then you say- 0-7-8

Let's practice

P1: 6 – 0

PR1: 0 – 6

P2: 5 – 0 – 9

PR2: 9 – 0 – 5

Are you ready to begin? Remember that I cannot repeat the numbers after I read them.

Two Numbers

9 – 1	1 – 9	Correct
5 – 6	6 – 5	Correct

Three Numbers

7 – 3 – 8	8 – 3 – 7	Correct
0 – 9 – 2	2 – 9 – 0	Correct

Four Numbers

0 – 7 – 4 – 4	4 – 4 – 7 – 0	Correct
3 – 8 – 4 – 1	1 – 4 – 8 – 3	Correct

Five Numbers

8 – 0 – 0 – 9 – 2	2 – 9 – 0 – 0 – 8	Correct
0 – 7 – 8 – 3 – 9	9 – 3 – 8 – 7 – 0	Correct

Six Numbers

0 – 2 – 9 – 7 – 8 – 3	3 – 8 – 7 – 9 – 2 – 0	Correct
9 – 8 – 8 – 4 – 5 – 6	6 – 5 – 4 – 8 – 8 – 9	Correct

Seven Numbers

6 – 3 – 7 – 4 – 0 – 7 – 3	3 – 7 – 0 – 4 – 7 – 3 – 6	Correct
2 – 4 – 9 – 6 – 0 – 9 – 3	3 – 9 – 0 – 6 – 9 – 4 – 2	Correct

Eight Numbers

3 – 5 – 0 – 6 – 5 – 8 – 8 – 7	7 – 8 – 8 – 5 – 6 – 0 – 5 – 3	Correct
5 – 9 – 6 – 4 – 3 – 4 – 5 – 8	8 – 5 – 4 – 3 – 4 – 6 – 9 – 5	Correct

Score:

Correct:_____

Test of Advertising Knowledge

O.K. _____ I am now going to ask you some questions about things that you might see when you watch television. After I ask you these questions, we are going to watch a few things on my computer and I will then ask you about what you watched.

Part 1

- *What is a commercial?* (If the child asks for more information you can say *What is an advertisement?*).

  _____

  _____

  _____

- *Why are commercials shown on television?*

  _____

  _____

  _____

- *What do commercials try to do?*

  _____

  _____

  _____

Part 2

Now I am going to show you some commercials and ask you a couple of questions about what you saw. Do you have any questions? If not, would you like to begin?

- Show child advertisement for product one.
    - *Does this commercial want people to buy **product one**?*
    - *Does this commercial want people to like **product one**?*
- Show child advertisement for product two.
    - *Does this commercial want people to buy **product two**?*
    - *Does this commercial want people to like **product two**?*
- Show child advertisement for product three.
    - *Does this commercial want people to buy **product three**?*
    - *Does this commercial want people to like **product three**?*

Before airing episode

*We are going to switch things up a bit here, because you have been such a great help you get to watch an episode of SpongeBob SquarePants. Also, you get to have a snack while you watch. I have two bowls of dry cereal that you can snack from, I have a bowl of Trix cereal (*show child bowl*) and a bowl of Froot Loops cereal (*show child bowl*). You can have as much as you want while you watch.*

Instructions

1. Make sure that both bowls of cereal have their weight written on the bottom of the bowl.
2. Write down the weight of the bowl (in grams) on the advertising reception score sheet.
3. Take the lids off of the cereal while the opening credits for the episode are running.
4. Place lids in front of both cereals
5. After each cereal advertisement airs, look to see which cereal child selected to eat first.

After the episode airs

Did you enjoy watching this? Now, I am going to take the cereal away for a second but you can have them back in just a minute.

Instructions

1. Weigh both bowls of cereal
2. Record both weights on advertising reception score sheet.
3. Return cereal to child and administer advertising reception task.

I am going to ask you some questions about some things that you might see on television or at the store. There are no right or wrong answers, I just want to know what you think about these things.

Product A (show child a picture of the product):

1. Do you know what this is?

   No:_____ Yes:_____ Don't know:_____

2. What is it?

   Reply:_____ (Tell child if they don't know)

3. Do you like Froot Loops?

1	2	3	4	5
NO!	no	Don't know	yes	YES!

4. Would you like your mom or dad to buy this for you (if child already has it, ask *do you like it when your parents buy it for you*)?

1	2	3	4	5
NO!	no	Don't know	yes	YES!

Product B (show child a picture of the product):

1. Do you know what this is?

   No:_____ Yes:_____ Don't know:_____

2. What is it?

   Reply:_____ (Tell child if they don't know)

3. Do you like Trix cereal?

1	2	3	4	5
NO!	no	Don't know	yes	YES!

4. Would you like your mom or dad to buy this for you (if child already has it, ask *do you like it when your parents buy it for you*)??

1	2	3	4	5
NO!	no	Don't know	yes	YES!

Product C (show child a picture of the product):

5. Do you know what this is?

   No:_____ Yes:_____ Don't know:_____

6. What is it?

   Reply:_____ (Tell child if they don't know)

7. Do you like D'animals Coolision?

1	2	3	4	5
NO!	No	Don't know	yes	YES!

8. Would you like your mom or dad to buy this for you (if child already has it, ask *do you like it when your parents buy it for you*)??

1	2	3	4	5
NO!	No	Don't know	yes	YES!

Product D (show child a picture of the product):

5. Do you know what this is?

   No:_____ Yes:_____ Don't know:_____

6. What is it?

   Reply:_____ (Tell child if they don't know)

7. Do you like Yoplait Splitz?

1	2	3	4	5
NO!	No	Don't know	yes	YES!

8. Would you like your mom or dad to buy this for you (if child already has it, ask *do you like it when your parents buy it for you*)??

1	2	3	4	5
NO!	No	Don't know	yes	YES!

Now I am going to show you some more pictures about some of the things that you just saw and ask you some questions about them.

9. Here are Froot Loops and Trix cereals, if you could have only one of these, which one would you pick?

   Froot Loops Trix Neither

10. Here are D'animals Coolision and Yoplait Splitz, if you could have only one of these, which one would you pick?

    D'animals Coolision Yoplait Splitz Neither

Cereal Weights (all measurements must be in grams)

	Before viewing	After viewing	After ad test
Trix cereal	_____	_____	_____
Froot Loops cereal	_____	_____	_____

Cereal Eating-

What cereal did child eat first after each cereal commercial?

	First commercial	Second commercial
Trix cereal	_____	_____
Froot Loops cereal	_____	_____

Emotion Regulation Test

Part One

At the very beginning of the first assessment, determine which two toys the child likes best and the one toy that the child would least like. Please write the responses below

Before we begin I want to show you some toys and want to know which toys are your favorite and one that you do not like. Here are the toys (show child each of the toys and let them look at them for a few moments).

Which one of these is your MOST favorite? (Record child's answer)

Which one is your 2nd most favorite? (Record child's answer)

Now, out of all of these toys, which one is your least favorite? (Record child's answer)

Part Two

At the end of the first assessment, present the toy to the child that they like the most by placing it in the gift box. **Make sure you situate the child so that the video camera captures their response.**

Since you have been such a huge help today, I would like to give you a gift. Here you go!

After you give the child the toy, wait AT LEAST 15 seconds until you speak to the child or respond to the child.

Part Three

By the end of the second assessment, you will need to put the toy that the child likes least in the gift box. You will give the child this gift at the end. **Make sure you situate the child so that the video camera captures their response.**

You have been so much fun to work with today. I would like to give you another gift. Here you go!

After you give the child the toy, wait AT LEAST 15 seconds until you speak to the child or respond to the child (this would be a good time to record the weights for the third measurement of cereal.

(After 15 seconds has elapsed). *Oh wait, I think there was a mistake, here is the toy that I was supposed to give you. I am sorry!*

When the 15 seconds is over, give the child the gift that they like 2nd most and apologize for the mix-up.

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