

# What Can the Study of Cognitive Development Reveal About Children's Ability to Appreciate and Cope with Advertising?

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*The authors assess the study of cognitive development and what it reveals about children's ability to appreciate and cope with advertising. Whereas prior research on children and advertising has drawn heavily on Piaget's developmental theory, the authors argue that more recent approaches that focus on the development of children's "theories of mind" and "executive functioning" skills may prove more fruitful. The review of research on these topics generates two predictions: First, on the basis of theories-of-mind literature, the authors expect that children have well-formed conceptions of the intentions underlying advertising by seven or eight years of age. Second, on the basis of executive functions literature, the authors expect that children are not able to deploy these concepts effectively in their everyday lives until much later in development.*

**T**he ability to gather information from social sources is a hallmark of the human species that contributes immeasurably to uniquely human achievements such as language, science, and technology. The overwhelming share of knowledge is acquired through social transmission, a process that enables understanding to grow quickly well beyond what could otherwise be acquired through the range of experiences to which any single person is exposed (Baldwin and Moses 1996; Bruner 1990; Tomasello 1999). Much of this social learning occurs in childhood, a period during which it may be adaptive for people to be especially open to social communication. Children begin life as novices in every domain and can thrive only through voracious consumption of the expertise that is available in their culture.

Yet there is surely a downside to children's proclivity to seek social information so actively. An open system is an exposed system. As Dawkins (1993, pp. 13–14) writes, this openness leaves children "vulnerable to subversion, easy prey to Moonies, Scientologists, and nuns. Like immune-deficient patients, children are wide open to mental infections that adults might brush off without effort." In line with this appraisal, children are commonly described as naive, gullible, suggestible, impressionable, and overly trusting.

Given this perception of children as highly vulnerable, concerns about whether advertising might unfairly influence them have arisen. Children's exposure to advertising is extensive and ever increasing. Moreover, advertising directed at children is everywhere: on television, on radio, on billboards, in newspapers, in magazines, increasingly on

the Internet, and even in schools (Calvert 2003; Kunkel et al. 2004). In light of children's cognitive immaturity, however, it is legitimate to question the appropriateness of allowing them to be exposed to sophisticated and sometimes misleading advertising. Particular concerns have been raised about whether exposure to advertising contributes to increasingly materialistic values in children, conflicts between children and parents over the purchase of advertised products, childhood obesity and poor eating habits, and the formation and maintenance of gender and ethnic stereotypes (Gunter, Oates, and Blades 2005). The extent to which such concerns are valid is controversial, and not surprisingly, regulation of advertisements directed at children varies enormously from country to country and from medium to medium (Gunter, Oates, and Blades 2005).

The extent to which children are indeed vulnerable to advertising is an empirical question that is best answered through empirical research. The aim of this article is to describe ways that basic research on children's cognitive development might contribute to debates over advertising to children. Our focus centers on television advertising because this is the most frequent medium through which children are exposed to advertising (Roberts, Foehr, and Rideout 2005). We begin with a brief analysis of criteria that can be employed in assessing (1) whether children understand the nature of advertising and (2) whether they are capable of establishing effective cognitive defenses against its potentially adverse effects. We then discuss several prominent theoretical frameworks from the field of developmental psychology that might be useful in assessing children's understanding of and ability to cope with advertising. We suggest that Piaget's theory of cognitive development, which has frequently been drawn on in the literature on children and advertising, is not especially helpful in developing such an assessment. Instead, we argue that recent research on children's developing "theories of mind" and on their developing "executive functioning" skills may prove more fruitful. We review relevant literature on these topics and

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then assess the implications of research in these areas for understanding of children's advertising-relevant skills. We conclude by offering some suggestions for further research.

### **Criteria for Assessing Children's Ability to Understand and Cope with Advertising**

What does it mean to understand the nature of advertising? What criteria should be used to assess whether children have sufficient cognitive skills to appreciate and cope with advertising? Even adults are not fully guarded against the effects of sophisticated advertising. Still, adults possess a range of advertising-relevant knowledge and skills that then can be used as a benchmark against which to assess children's relative competence in this domain (see Friestad and Wright 1994; Roberts and Maccoby 1985; Wright, Friestad, and Boush 2005; Young 2000).

To understand advertising, children require some ability to distinguish advertisements from surrounding program content. Children need to know when they are viewing advertisements to have any hope of guarding against them. By itself, however, simple discrimination reveals little about understanding because discrimination can be made on the basis of superficial perceptual features that have little or nothing to do with critical differences between advertisements and programs. For example, advertisements and programs differ in length, audiovisual effects, and so forth, and children might identify advertisements solely on these bases (Gunter, Oates, and Blades 2005).

A stronger, more appropriate criterion would additionally include having the ability to recognize the purposes of advertising. These purposes are complex and multifaceted, and thus an assessment of children's appreciation of these purposes will not necessarily be straightforward. Advertisements typically reflect a set of hierarchically embedded intentions of the advertiser. The overarching intention is to induce consumers to buy a product (i.e., selling intent). The advertiser wants people to buy the product and believes that by emphasizing its benefits to consumers, the likelihood of their buying the product will increase. Typically, the advertiser attempts to convince the consumer of the virtues of the product, though more subtle influences may also be operating outside the consumer's conscious awareness. For example, mere exposure to the product may increase preference for it (Zajonc 2001), as may exposure to celebrity endorsers of the product (Ross et al. 1984).

The goal of "persuasive intentions" is to change others' mental states or their behavior (or both). In the context of advertising, persuasive intentions might be aimed at influencing consumers' behavior directly, but they are more typically aimed at doing so indirectly by attempting to generate beliefs about the desirability of a product. Other types of intention may be nested within an advertiser's intent to persuade. For example, advertisements typically reflect "informative intentions"; that is, the advertiser aims to let consumers know about the availability of the product, its important features, and where it can be purchased. Informative intentions also typically reflect the fundamental self-interest of the advertiser, which likely generates a biased or one-sided view of the product. Thus, some form of "promotional intent" is usually present in advertising. Such intent

may lead the advertiser to exaggerate positive attributes of the product or to focus on positive features while downplaying negative features (Preston 1994). Promotional intent may or may not be accompanied by explicit "deceptive intent" or "manipulative intent." Regardless, it creates the possibility that consumers will be misled by advertising.

Recognition of informative intent requires an appreciation of people's differences in knowledge. Unless people recognize that, in some circumstances, they may be ignorant whereas others are knowledgeable, they will not understand the point of seeking information, and they will not recognize such information when it is offered (Baldwin and Moses 1996). Recognition of promotional intent requires an appreciation that the interests of the advertiser and the consumer do not necessarily coincide. Recognition of the possibility of deceptive intent will be enhanced if consumers appreciate that the advertiser's promotional intent may be generating a biased and potentially misleading assessment of the product. Finally, recognition of the overarching intent to sell will likely be enhanced by an appreciation that the advertiser is trying to make money, which in turn will be facilitated by some level of understanding of the profit motive and its role in the marketplace.

Thus, inferring the purposes of advertising requires substantial perspective-taking skill. Consumers need to appreciate that others do not necessarily share their perspective, that perspectives may conflict, and that particular perspectives may engender a complex set of hierarchically embedded intentions. This set includes intentions to make money; to sell a product; to promote that product; and to persuade, inform, and sometimes deceive consumers.

However, consumers can have all of this conceptual knowledge about differing intentions and perspectives and still fall prey to the adverse effects of advertising. For example, consumers could forget to use their knowledge; they could fail to detect or fail to attend sufficiently to advertising bias; or fully recognizing this bias, they could nonetheless be poor at retaining that knowledge or at using it to control subsequent thought or behavior. In principle, having generic conceptual knowledge, determining how that knowledge applies in specific instances, and translating knowledge into action (or inaction) are distinct capacities.

Appreciating the nature of advertising and learning how to cope with it effectively are not simple matters that are likely to be instantaneously grasped by children at some specific point in development. Rather, a whole set of understandings and skills is necessary, and these likely manifest at different ages and at different times for specific children in specific cultural contexts. Moreover, after these abilities emerge, it probably takes some time before children become proficient in using them. We now examine what research and thinking in the field of cognitive development reveal about the emergence and subsequent development of abilities relevant to understanding and coping with advertising.

### **Theoretical Approaches to Cognitive Development**

It would be convenient if there were a single, widely accepted theoretical framework in developmental psychology from which to generate straightforward answers to

questions about the development of advertising-relevant abilities. However, such a framework does not currently exist. At one time, Piaget's (1932, 1952, 1970) theory of cognitive development dominated the landscape of developmental psychology, and the theory (or extensions of it; e.g., Selman 1971) has been drawn on heavily in the literature on children and advertising (Calvert 2003; Johnson and Young 2003; Kunkel 2001; Young 1990, 2003). However, although core aspects of Piaget's theory retain many adherents (e.g., Beilin and Pufall 1992; Chapman 1988) and although his ideas have profoundly shaped new approaches, the theory is now just one among a growing set of accounts purporting to explain developments in children's thinking. In what follows, we briefly review Piaget's approach along with some relevant competitors.

Piaget argued that children advance through a series of increasingly adaptive stages of intellectual development, each stage defined by the emergence of a different set of cognitive structures. In the sensorimotor period (approximately 0–2 years of age), Piaget argued that children are not capable of generating mental representations of anything other than what is perceptually available in a given moment. During the preoperational period (approximately 2–7 years of age), he argued that symbolic representation emerges, which is evidenced by the development of language, pretense, and related abilities. According to Piaget, however, children's thinking in this period is unsystematic and often illogical. He believed that children are incapable of recognizing such distinctions as those between fantasy and reality, appearance and reality, mental and real entities, and psychological and physical causality. Moreover, he argued that these children are highly egocentric and frequently attribute their own visual or conceptual perspective to others. During the concrete operational period (approximately 7–11 years of age), Piaget argued that children's thinking becomes more systematic. At this stage, they become capable not only of mentally representing the world but also of mentally transforming such representations in well-reasoned ways. During this period, children begin to recognize that it is possible to have multiple perspectives on the same scene or event. Nonetheless, children are cognitively limited during this period, and their thinking can be applied only to concrete contexts. According to Piaget, the ability to reason about hypothetical, abstract situations does not emerge until the formal operational period (approximately 11 years of age and older).

The implications of Piaget's approach for what children might understand about advertising are clearest with respect to his preoperational stage. Piaget believed that children in this stage have little appreciation for others' perspectives and little appreciation of others' intentions. His ideas have generated the prediction that until children reach the concrete operational period, they should be unable to understand that advertisers and consumers hold different perspectives, let alone that advertisers might intend to mislead consumers (Calvert 2003; Johnson and Young 2003).

Beyond that, however, it is not entirely clear what the Piagetian approach can contribute to the understanding of how children interpret advertising. The approach offers little guidance in determining more precisely how and when children come to understand the different kinds of intentions

underlying advertising or the impact that understanding has on children's ability to recognize the frequently biased nature of advertising. Moreover, the Piagetian approach was increasingly challenged during the 1970s and 1980s, and as we discuss subsequently, these challenges question the validity of inferences about children's understanding of advertising based on Piaget's characterizations of young children as preoperational.

For example, it was argued that Piaget's stages appear to lack coherence. That is, it is often difficult to classify children into specific stages because their abilities across domains are often markedly different. Difficulties of this sort eventually led many researchers to question the notion of domain-general, content-independent stages (Flavell 1971; Wellman and Gelman 1998). Moreover, it became clear that Piaget had often underestimated (and sometimes grossly underestimated) young children's cognitive abilities. Many of the cognitive tasks he assigned to children were unnecessarily complex, and successful performance often required sophisticated verbal abilities. Thus, children may have done poorly on these tasks for reasons extraneous to their understanding of the concepts being tested. When these extraneous demands were removed, children often revealed a good deal of conceptual competence (Gelman and Baillargeon 1983). Finally, at the other end of the developmental spectrum, research in social and cognitive psychology revealed that the reasoning of adolescents and adults often fell well short of the intellectual standard that Piaget's formal operations stage implied (Kahneman, Slovic, and Tversky 1982).

In the wake of such challenges, several broad trends emerged. First, there was increasing emphasis on the "early competence" of children (Gelman and Baillargeon 1983). Second, the competence–performance distinction became the explicit focus of many studies (Donaldson 1978). Researchers became more sensitive to the notion that children might possess conceptual knowledge (competence) without being able to express it effectively under all circumstances (performance). Third, greater attention was directed toward fine-grained analyses of the cognitive skills and processes required for successful performance on specific tasks (Siegler 1996). Finally, because of doubts about the validity of domain-general stages, greater emphasis was placed on assessing children's knowledge and development in specific domains (Hirschfeld and Gelman 1994; Wellman and Gelman 1998).

These trends are reflected in a variety of new theoretical frameworks. Most germane to children's advertising-relevant skills are (1) those that emphasize domain-specific knowledge and (2) those that emphasize how domain-general, information-processing skills impinge on the development of domain-specific knowledge.

Domain-specific approaches focus on specialized knowledge and/or cognitive processing in particular content areas. These approaches come in many varieties, differing in part on what constitutes a domain. For example, novice–expert approaches focus on the substantial processing advantages that expertise in specific areas confers (Chi, Glaser, and Farr 1988). For proponents of these approaches, there are as many domains as there are areas in which people develop expertise. In contrast, proponents of theory-based

approaches (Carey 1985; Gopnik and Wellman 1994) argue that children acquire broad framework theories in domains that have high ecological significance (e.g., physics, psychology, biology, numerical reasoning). With development, these theories undergo radical changes, and older theories are replaced by more adaptive ones.

Information-processing approaches acknowledge the importance of domain-specific knowledge but argue that domain-general changes in working memory, processing speed, or other all-purpose mechanisms constrain children's development in these domains (Case 1998; Halford 1999; Pascual-Leone and Johnson 1999). These approaches attempt to chart how such mechanisms develop over time, to assess the specific computational requirements of tasks designed to assess particular abilities, and then to predict or explain patterns of performance on these tasks on the basis of what is known about the development of all-purpose mechanisms.

Both approaches contribute to ways of thinking about children and advertising. Domain-specific approaches (especially theory-based accounts) are most relevant to children's conceptions of advertising, whereas information-processing approaches are most relevant to children's ability to cope and defend against advertising. In what follows, we examine these related but nonetheless distinct issues.

## Children's Conceptions of Advertising

### The Development of Children's Theories of Mind

One of the earliest theories children develop is a theory of mind (Wellman and Gelman 1998). In this context, theory of mind refers to a coherent body of folk knowledge about the mind and mental states that can be used to interpret, predict, and explain human action and interaction. It is sometimes termed a "belief-desire psychology" (Wellman 1990) because almost all explanations of intentional behavior refer to either how actors represent the world (beliefs) or their motivations (desires). Developmental changes in children's theories of mind should dramatically affect their conceptions of advertising. Children's recognition of the goals, intentions, beliefs, and biases underlying advertising is thoroughly dependent on how they think about the mind.

An appreciation of mental life begins in infancy but develops all the way through adulthood (Malle and Hodges 2005). The most heavily studied period has been the preschool years, though increasing attention is now being devoted to earlier development in infancy and to later development in middle childhood and beyond. We begin by briefly reviewing theory-of-mind development in the preschool period and then turn our attention to earlier and later advances, respectively. The literature on children's theories of mind is vast (for more extensive reviews, see Flavell and Miller 1998; Moses and Chandler 1992; Wellman 2002). Our review is necessarily selective, focusing on the developments that have relevance in assessing what children might understand about advertising.

### The Preschool Watershed

The preschool years are often considered something of a watershed in the development of children's theories of

mind. During this time, children acquire what is often referred to as a "representational" theory of mind (Perner 1991). That is, they begin to understand that mental states are representations of the world and that people act on the basis of these representations rather than on the basis of how the world actually is.

The clearest demonstration of this developmental milestone can be observed in children's performance on false belief tasks (for a meta-analysis, see Wellman, Cross, and Watson 2001). In the standard false belief task (Wimmer and Perner 1983), children are told a story about a boy who acquires a false belief about the location of some chocolate by virtue of being absent when the chocolate is moved from one location to another. Children are then asked where he will look for the chocolate and/or where he thinks it is. Younger preschoolers (two- and three-year-olds) typically state that he thinks the chocolate is in its actual location and that he will look for it in that location. In contrast, older preschoolers (four- and five-year-olds) most often correctly state that he thinks the chocolate is in its original location (where the boy last saw it) and that he will look for it there. These older children appear to recognize not only the possibility of false beliefs but also their role as determinants of action.

A series of related developments occurs at about the same age. For example, children begin to realize that appearances may differ from reality (Flavell, Flavell, and Green 1983), that different people may have different visual perspectives of the same object (Flavell et al. 1981), that perception leads to knowing (Pillow 1989), that different perceptual modalities lead to different kinds of knowledge (O'Neill, Astington, and Flavell 1992), and that thinking something is different from knowing it (Moore, Pure, and Furrow 1990). On the basis of these findings, it is argued that older preschoolers have acquired an understanding of the mind as a kind of representational organ that takes in information (sometimes partial, sometimes faulty), forms representations of the world based on this information, and subsequently generates actions based on these representations (Flavell 1988; Gopnik 1993; Perner 1991; Wellman 1990).

### Earlier Developments

Recognition that people may hold different beliefs is an impressive demonstration of perspective taking that occurs at a much younger age than Piaget's theory predicts. Even earlier in development, however, children are capable of certain forms of perspective taking. By two or three years of age, children appreciate that other people may have different emotions, perceptions, and desires from their own (Denham 1986; Lempers, Flavell, and Flavell 1977; Wellman and Woolley 1990). One of the most consistently found sequences in the study of children's theories of mind is that motivational states (goals, desires, intentions) are understood earlier and more readily than epistemic states (beliefs and knowledge) (Wellman and Liu 2004). For example, in well-controlled experimental studies, preschoolers have great difficulty recognizing that beliefs can differ from reality, yet they are much less troubled by desires that do not match reality (Lillard and Flavell 1992). Similarly, recognizing that they held a belief that differs from their current

belief is more challenging than recognizing that they previously held a desire that differs from their current desire (Gopnik and Slaughter 1991). The desire–belief asymmetry is also apparent in naturalistic analyses of children's language. Children talk much more often and substantially earlier about desires than about beliefs (Bartsch and Wellman 1995). For these reasons, Wellman (1990) argues that two-year-olds are “desire psychologists,” whereas older preschoolers are full-fledged “belief–desire psychologists.”

A similar precocity is present with respect to understanding intentions (Malle, Moses, and Baldwin 2001; Zelazo, Astington, and Olson 1999). Appropriate processing of others' intentional actions begins to develop early in infancy (e.g., Baldwin and Baird 2001; Wellman and Phillips 2001). For example, infants as young as 5 months of age appreciate the object-directed quality of human intentional acts, such as grasping (Woodward 1998). Moreover, at least by the age of 10–11 months, infants appear to perceive the largely continuous stream of human actions around them as a series of relatively discrete action chunks that map on to what adults would identify as intentional action units (Baldwin et al. 2001). Although infants this young may not perceive these chunks as intention driven per se, they have at least analyzed the input in a way that will facilitate their mapping intentions into actions when such concepts emerge.

By the second year of life, infants behave in ways that suggest they are indeed drawing inferences about intentions. The phenomenon of “social referencing” is a case in point. Faced with a novel and ambiguous object, 12-month-olds use emotional input from an adult to modulate their behavior toward the object. That is, they will approach the object if the adult smiles but remain wary if the adult appears worried (Campos 1983). Appropriately, however, they use such input only if it is clear that the emotional signal is intentionally directed toward the specific object in question (Moses et al. 2001). Similarly, in the realm of language learning, infants that are about this age spontaneously exploit clues in others' intentional action in making inferences about word meanings (e.g., Baldwin 2000; Tomasello 1999). Finally, by the age of 12–15 months, infants readily interpret basic intentions underlying novel sequences of action (e.g., Meltzoff and Brooks 2001), and they weight information about intentions heavily in their response to others' behavior (e.g., Baldwin and Moses 2001). For example, they will reenact a novel action to achieve a goal after witnessing an adult repeatedly attempt but fail to achieve that goal (Meltzoff and Brooks 2001). In this context, infants do not imitate the surface behavior of the adult, but rather the action they have inferred would fulfill the intention underlying that behavior (see also Carpenter, Akhtar, and Tomasello 1998).

Despite this early sensitivity to and understanding of motivational states, some aspects of desire and intention are not understood until later (Malle et al. 2001). For example, it is not until three or four years of age that children recognize that an intention to act is typically accompanied by a belief that the intention will be carried out (Moses 1993). Furthermore, children do not fully distinguish intentional acts from involuntary actions, such as reflexes, until they are at least four years of age (Smith 1978). Similarly, they do not fully distinguish intentions from desires until five years

of age (Schult 2002). For example, children younger than this age do not always appreciate that an outcome can satisfy a desire without necessarily having been intended (the desirable outcome may have occurred fortuitously). Finally, it is not until about five years of age that children recognize that the very same action could have been motivated by quite different intentions (Baird and Moses 2001).

## Later Developments

Important changes in children's theories of mind also occur beyond the preschool period. Between the ages of five and seven, for example, children develop an understanding of so called second-order mental states (Perner and Wimmer 1985; Sullivan, Zaitchik, and Tager-Flusberg 1994; Winner and Leekam 1991). The false belief task we described previously involves an appreciation of first-order mental states (i.e., a character's belief about the location of chocolate). An example of a second-order mental state would be what some new character thinks the boy thinks about the location of the chocolate (e.g., Where does Mary think that John thinks the chocolate is?). To appreciate these matters, children need to recognize that mental states may be embedded within other mental states. However, second-order mental states do not always involve beliefs about beliefs. They might, for example, involve beliefs about intentions, intentions about beliefs, or any other combination of mental states. Notably, second-order intentions may be understood somewhat earlier than second-order beliefs. For example, four- and five-year-olds appear to understand the difference between a statement that is uttered as a lie and a statement that is uttered jokingly (Leekam 1991). In the case of a lie, the speaker intends the audience to believe the statement, whereas in the case of a joke, the speaker intends the audience not to believe the statement.

An arguably more fundamental development involves a shift from viewing the mind as a relatively passive container of information to viewing it as an active assimilator of information (Carpendale and Chandler 1996; Chandler and Sokol 1999). The shift to such a constructivist or interpretive theory of mind begins between the ages of five and seven and continues through adolescence and into adulthood (Chandler 1987; Pillow 1999). As part of this shift, children begin to understand the meaning of informational input not as something awaiting “discovery” in some observer-neutral reality but rather as imposed by the mind as part of a process of active construal. Thus, they begin to recognize the influence of preference, bias, prejudice, and other aspects of subjectivity on people's thinking (Pillow and Weed 1995). The onset of a constructivist theory of mind carries with it an appreciation of interpretive diversity such that children recognize that different people might render or construe the meaning of an action or event in fundamentally different ways. For example, by seven or eight years of age, children can explain how two people might come to different interpretations of an ambiguous drawing or sentence (Carpendale and Chandler 1996).

## Implications of Theory-of-Mind Development for Children's Appreciation of Advertising

What does theory and research on children's theories of mind suggest about when an understanding of various facets of advertising develops? In our attempt to answer this question, we focus on three central issues: (1) distinguishing between advertising and program content, (2) inferring the intentions underlying advertising, and (3) recognizing biases in advertising.

### Distinguishing Advertising from Program Content

Given what is now known about young children's cognition, we expect that under the right circumstances, even preschoolers would have little difficulty distinguishing between advertising and surrounding program content. Provided that children have sufficient exposure to advertising and that the contrast between advertisements and programs is maximized, it would appear that children have the conceptual tools necessary to make the distinction. Preschool children are capable of making sophisticated distinctions among different ontological categories. For example, they recognize the distinction between mental things and real things (e.g., a thought about an apple versus a real apple; Wellman and Estes 1986), between fantasy and reality (Taylor and Carlson 1997; Woolley 1997), between appearance and reality (Flavell, Flavell, and Green 1983), and between television images and real objects (Flavell et al. 1990).

Children's ability to discriminate between advertisements and programs varies from study to study; some indicate that only considerably older children have acquired the distinction (see Gunter, Oates, and Blades 2005). However, this variability is not surprising, because a host of factors are likely to affect children's ability to make the distinction in any particular instance. These factors include similarity in form between the genres, the subtlety of the underlying persuasive message in an advertisement, and the presence or absence of separators between the advertisement and the program (Gunter, Oates, and Blades 2005).

An important caveat is in order. Even young infants are capable of making subtle perceptual discriminations, as evidenced by the different patterns they exhibit when looking at different stimuli (Kellman and Banks 1998). What is often more difficult to determine, however, is the basis on which a discrimination is made. An important distinction in this regard is between characteristic and defining features (Keil and Batterman 1984). Characteristic features are those that are typically present for members of a category but that are not necessary for category membership. In contrast, defining features are those that are necessary for category membership. For example, flying is a characteristic feature of birds, but it is not defining (e.g., penguins are birds, but they do not fly). As others have noted (Gunter, Oates, and Blades 2005), children might discriminate between advertisements and programs on the basis of superficial perceptual content (i.e., characteristic features) without divining the true purpose of advertisements (i.e., its defining feature). That is, they might make such a discrimination on the basis

of differences in length, form, nature of audiovisual effects, or some other characteristic feature. They might do so without appreciating that the defining feature of advertisements is that they are intended to sell, whereas the defining feature of programs is that they are intended to entertain or edify.

### Understanding the Intentions Underlying Advertising

As we indicated previously, the purposes of advertising are complex; thus, there is likely no single answer to the question of when children come to understand the nature of advertising. Some of the goals and intentions of advertising may well be understood early in development, whereas others may not be understood until appreciably later.

#### *Recognizing the Intent to Sell*

To begin, at least in principle, even young preschoolers should be able to recognize that advertisers want people to buy their products and are trying to persuade them to do so. In terms of mental state attribution, such recognition is not that different from children understanding that their parents want them to eat their greens or to brush their teeth and are trying to make them to do these things. As we discussed previously, a simple understanding of desires and intentions of that kind is in place at the beginning of the preschool years (Wellman and Woolley 1990). There is little reason to suppose that children of this age could not perceive the overarching intention of advertisements, though that intention might be difficult to discern in subtle forms of advertising.

#### *Recognizing Persuasive Intent*

What is surely more difficult for children to understand is how advertisers intend to influence the consumption behavior of viewers. Typically, the advertiser intends to persuade consumers by inducing a change in their mental states (though, as we noted previously, more subtle forms of influence may be present). Specifically, the advertiser usually intends to change consumers' desires for the product in question and intends to do that by changing their beliefs about the nature of the product. Thus, the persuasive intentions of advertisers are conceptually more complex than simple desires and intentions to sell products. In particular, persuasive intentions involve embedded mental states: They take as their object consumers' beliefs and desires. Understanding such intentions rests on an appreciation of second-order mental states (intentions about beliefs and desires), and as we have observed, children do not develop such an appreciation until they are at least four or five years of age (Leekam 1991). Thus, we anticipate that children might have difficulty recognizing persuasive intent until they reach the end of the preschool period.

As far as we know, there is no research within a theory-of-mind context on children's comprehension of persuasion directed at them. However, there is a small body of work on children's own ability to persuade others. Although prior research conducted within a Piagetian framework (e.g., Clark and Delia 1976) suggests that such an ability is not well developed until adolescence, more recent work (Bartsch and London 2000; Bartsch, London, and Campbell 2005) indicates that in simple contexts, children who are six

to seven years of age consistently take another's beliefs into account in framing their persuasion attempts. For example, if Eric believes that kittens scratch, whereas Kate believes that kittens are dirty, children of this age will attempt to persuade Eric to pet the kitten by focusing on the kitten not having claws. Conversely, they will attempt to persuade Kate to do so by focusing on the kitten being clean.

Notably, younger children use more primitive persuasive strategies in trying to persuade others to do what they want. These strategies appear to be aimed at changing their partner's behavior directly rather than doing so through influencing their mental states. That is, rather than attempting to change others' beliefs, younger children often focus on strategies such as bargaining, nagging, begging, or making threats (Trawick-Smith 1992; Weiss and Sachs 1991).

In summary, young children try to persuade others to do what they want, but only in later stages of development do they do so by attempting to influence mental states. These developmental changes in children's own persuasive strategies roughly parallel what we have predicted with respect to their comprehension of persuasive intent in advertising. That is, we have argued that even young preschoolers should understand that an advertiser is trying to persuade them to buy a product, but only at later stages of development would they understand that advertisers do so by attempting to influence consumers' beliefs and desires.

### ***Recognizing Informative and Deceptive Intent***

As we noted previously, advertisers may try to influence consumers' mental states in several ways. They typically intend to inform consumers about desirable features of a product. However, they may also attempt to deceive (at least in the sense of providing exaggerated or one-sided information about the product). What do children understand about informative intentions and deceptive intentions? As we mentioned previously, recognition of informative intent requires an appreciation of knowledge differences among people. Unless children understand that others often know things that they do not, they will fail to recognize when someone is trying to give them information about something they do not already know. Although even one-year-olds may recognize some forms of communicative intent, such as the intent to use language to refer to specific objects in the world (Baldwin and Moses 1996), there is no compelling evidence that children understand informative intent until a concept of knowledge emerges at two or three years of age (O'Neill 1996; Pillow 1989).

Moreover, research on children's understanding of teaching suggests that an appreciation of informative intent continues to develop through the preschool years (Frye and Ziv 2005). Teaching is a prototypical example of the intent to inform. However, Frye and Ziv find that preschoolers may not fully understand the informative intent of teaching. Specifically, they tend to overgeneralize teaching, focusing more on the outcome than on the intention. That is, preschoolers tend to think that if knowledge is gained, teaching has occurred, whereas if it is not gained, teaching has not occurred. For example, in one study, children between the ages of three and five were told a story in which a boy learns to tie his shoelaces by watching his sister tie hers. Even though his sister has no intention to teach him,

the boy nonetheless learns through observation. Children of both ages stated that teaching had occurred even though there was no intention to teach. It may be that it is not until children enter school that they explicitly recognize informative intentions, such as those underlying teaching, though they certainly acquire much knowledge through informal teaching well before school age.

It is possible that children's difficulties with informative intent are specific to the teaching context. If so, they might show better understanding in more generic contexts. This possibility can be explored by examining children's ability to distinguish informative intent and deceptive intent. An understanding of deception may actually have privileged status in the development of theory of mind. Indeed, some evolutionary psychologists have argued that an ability to infer the mental states of others may have been selected precisely because of the advantages conferred by the abilities to deceive competitors and to detect deception in others. At some point in evolutionary history, there may have been something of an evolutionary "arms race" in mind-reading capabilities, generating increasing levels of so-called Machiavellian intelligence (Humphrey 1976; Whiten and Byrne 1997).

Even toddlers engage in some forms of lying and deception. However, these early forms are often completely transparent (e.g., denial of wrongdoing even when caught red-handed), leading to the suspicion that they may simply be well-learned behaviors aimed at avoiding punishment rather than genuine attempts to manipulate the mental states of others (Perner 1991). Increasingly through the preschool period, however, children's deception becomes more generative and convincing (Carlson, Moses, and Hix 1998; Chandler, Fritz, and Hala 1989; Sodian 1991). They use novel means to deceive, and they recognize the effects of their deception on others' beliefs (Hala, Chandler, and Fritz 1991; Sodian et al. 1991). Around this age, they also begin to comprehend deception in others. For example, when a deceptive motive is introduced into the first-order false belief task (i.e., the target object is deliberately hidden in a new location as opposed to being inadvertently moved to that location), most four-year-olds recognize the effects of the deception on the protagonist's beliefs (Ruffman et al. 1993).

At the same time, children reveal at least an implicit appreciation of the distinction between informative and deceptive intentions. For example, they appropriately deceive a competitor but inform a cooperator (Sodian 1991). They also distinguish between lies and unknowingly mistaken utterances (Siegal and Peterson 1996; Wimmer, Gruber, and Perner 1985). Both lies and mistakes involve false statements. What distinguishes them, however, is the intention of the speaker: The liar intends to deceive, whereas the person making the mistaken utterance intends to inform. Thus, the distinction rests on an appreciation of second-order mental states: an intention to create a false belief versus an intention to create a true belief. Similarly, as we noted previously, four- and five-year-olds also recognize the distinction between lies and falsehoods that are uttered as jokes (Leekam 1991; Sullivan, Winner, and Hopfield 1995). The liar knows that his or her statement is false and intends to

mislead, whereas the joker knows that his or her statement is false but does not intend to mislead.

A final point worth noting with respect to deceptive intent is that few studies have assessed when children recognize that someone is trying to deceive them, and this is the closest analogue to what sometimes happens in the advertising context. Moreover, these studies examined deception in complex, interactive competitive hiding games in which children needed to guess the hand in which an opponent hid an item across a series of trials (DeVries 1970; Gratch 1964). Preschoolers showed little appreciation for the deceptive strategies their opponents used in these contexts. However, it remains unclear whether their failure to do so stemmed from a conceptual difficulty or from a problem computing complex perspectives.

What is known is that by the time children are four or five years of age, they recognize when they have been misled in certain contexts. The clearest evidence for this comes from studies of the appearance–reality distinction (Flavell, Flavell, and Green 1983). Appreciating that appearances may be misleading is important with respect to understanding advertising, and it is also a step toward understanding that a person has been purposely deceived. In standard appearance–reality tasks, four- and five-year-olds recognize, for example, that a fake rock appears to be a rock but is really a sponge (Flavell, Flavell, and Green 1983), that they initially believed that it was a rock, and that a naive other would also believe that it was a rock (Gopnik and Astington 1988). Notably, an understanding of real versus apparent emotion is not in place until about six years of age (Harris et al. 1986; Wellman and Liu 2004). Younger children do not appreciate that felt emotion may be different from expressed emotion.

In summary, an appreciation of aspects of both informative and deceptive intent is in place by four or five years of age. Children's understanding of such intentions may emerge somewhat earlier than their understanding of persuasive intent. Recall the finding that children do not consistently persuade by attempting to influence the mental states of others until they are six to seven years of age (Bartsch, London, and Campbell 2005). In Bartsch, London, and Campbell's studies, however, children did not need to deceive a person as part of their persuasive efforts. Given children's apparent precocity at understanding deceit, persuasion involving deception might emerge earlier in development. Another possibility is that comprehension of persuasion might emerge earlier than the ability to produce persuasive utterances. Indeed, in children's language acquisition, comprehension almost always precedes production (Bates 1993).

### Understanding Bias and Promotional Intent

It is one thing to recognize the existence of persuasive intent and its effects on another's beliefs and desires, but it is another to be aware of the form that such persuasive efforts might take. Advertising is motivated by a desire to sell a product. This desire typically generates a biased or one-sided presentation of information about the product. The advertiser intends to promote the product and does so by presenting it in the best possible light, emphasizing positive

features and downplaying or ignoring negative features. Unless a person recognizes the bias and promotional intent underlying advertisements, it may be difficult to detect potentially misleading information in advertising. As we discussed previously, recognition of bias is one aspect of a larger recognition that the mind is an active interpreter of information. People who hold a constructivist theory of mind recognize that in attributing meaning to events, people go beyond the information given by the external world. Among other things, people's preferences and biases affect how information is presented and interpreted.

A series of studies by Pillow (1991; Pillow and Henrichon 1996; Pillow and Weed 1995) indicates that preschool children do not recognize the role of bias or expectation in people's interpretation of events. Specifically, children of this age do not recognize that a negatively biased observer is more likely than a positively biased observer to construe a target person's ambiguous action as hostile. For example, Pillow and Weed (1995) told children stories in which a target character bumped into a desk and caused an observer's toy to fall and break. The observer either liked or disliked the target character. In these circumstances, preschoolers failed to understand that a positively biased observer would construe the action as accidental, whereas a negatively biased observer would construe it as intentional. It is not until children are at least six years of age that they begin to appreciate biased interpretation.

In a related series of studies on the development of cynicism, Mills and Keil (2005) examine children's understanding of promotional intent. Specifically, they investigate whether children of different ages are more likely to believe statements that are in line with self-interest as opposed to those that go against self-interest. For example, children were told a story in which two runners finished very close together in a race. In one condition (with self-interest), one of the runners claims that he has won the race, and therefore, he should receive the prize. In another condition (against-self interest), the runner claims that he has lost the race, and therefore, he should not be given the prize. Strikingly, in scenarios such as these, five- and six-year-olds tended to believe statements that were in line with self-interest more than those that went against it. In contrast, seven- and eight-year-olds were more likely to believe statements that were inconsistent with the speaker's self-interest.

Mills and Keil's (2005) findings are especially intriguing because they suggest that if younger children are cognizant of the self-interest of advertisers, counterintuitively, they may be more inclined to believe advertisers' claims about products. Moreover, the findings also suggest that including information that is against self-interest (e.g., disclaimers) is likely to be ineffective because such information may not be believed by children until they are seven or eight years of age. Consistent with this possibility, disclaimers have not been demonstrated to be effective at younger ages (Johnson and Young 2003).

A finding that may be related to those of Mills and Keil (2005) comes from a study that examines children's ability to detect ambiguity in messages (Beal and Flavell 1984). When six-year-olds knew a speaker's intention, they were less likely to detect message ambiguities than when they did not know it. With respect to advertising, these findings sug-



gest that if children have detected promotional intent, they either ignore or fail to perceive information that is neutral or inconsistent with that intent.

## Summary

Our analysis predicts the following developmental progression with respect to children's comprehension of advertising. We suspect that under the right conditions, preschoolers, and possibly infants, can perceptually discriminate a prototypical advertisement from a prototypical television program. By three years of age, children should be capable of recognizing the overarching purpose of advertising (i.e., the advertiser wants to sell a product). At this age, children should also understand simple persuasive intent aimed at directly influencing behavior (i.e., the advertiser is trying to persuade me to buy the product). Somewhere between three and five years of age, children should begin to recognize both informative and deceptive intent (i.e., the advertiser is providing me with information about the product, some of which may be misleading). By four to six years of age, an appreciation of persuasion aimed at influencing mental states may begin to emerge (i.e., the advertiser is trying to change my desires and beliefs about the product). Finally, an understanding of bias and promotional intent may not emerge until children are six to eight years of age (i.e., the advertiser wishes to promote the product and therefore is providing me with positively biased information about it).

How do these predictions fare when tested against findings from the literature on children and advertising? Unfortunately, the answer is not straightforward. Wide variation has been found in the age at which children demonstrate understanding of advertising. Much of this variation appears to be a function of differences in (1) methodological approach, (2) the specific aspect of advertising knowledge being studied, and (3) definitions of advertising concepts (see Gunter, Oates, and Blades 2005; Martin 1997; Wright, Friestad, and Boush 2005).

Our predictions are related to the youngest ages at which we believe that conceptions of different facets of advertising might be observed under ideal circumstances. That is, children might demonstrate these understandings when viewing simple, "child-friendly" advertisements involving multiple, explicit cues to advertisers' intentions. In the real world, however, advertising directed at children is typically complex, and advertisers' intentions may not be obvious. In these circumstances, considerably older children (and adults) may demonstrate little understanding of advertising and little ability to cope with it. However, we argue that these failures are unlikely to be conceptual, because by seven or eight years of age, children probably already possess the requisite concepts. Instead, the failures more likely reflect deficits in information processing.

## Children's Ability to Cope with Advertising

Coming to an accurate conception of the nature and purpose of advertising is a crucial step along the way to being inoculated against its potentially adverse effects. However, it is anything but a sufficient condition for being protected from these effects. Adults can also fall prey to misleading adver-

tising, even though they may know that advertisements present a positively biased portrayal of products. There is every reason to believe that children will be even more susceptible in this regard. The important theoretical distinction here is between competence and performance. As we discussed previously, a person may possess all of the relevant concepts in a given domain (i.e., be conceptually competent) and yet fail to apply those concepts in performing tasks either in the laboratory or in everyday settings.

Flavell's (1974) classic analysis of perspective taking may be helpful in this regard. He notes that an act of successful perspective taking has at least four components: existence, need, inference, and application. First, a person must recognize the existence of the type of mental state in question (e.g., an intention). Second, he or she must experience the need to figure out the perspective. For various reasons, a person may not think about it or may not see the point of figuring it out. Third, a person must be capable of inferring the perspective in a particular situation. Even if a person recognizes the existence of a type of mental state and desperately wants to figure it out, he or she may be poor at inferring or computing it. Fourth, a person must also be capable of applying such perspective-related inferences to the situation. The latter three steps require a plethora of cognitive skills, all of which undergo considerable development in childhood and adolescence. We believe that the most crucial among these skills are the so-called executive functions.

## The Development of Executive Functioning

Much of everyday behavior is of a routine, well-practiced, habitual kind (e.g., brushing teeth, getting dressed, riding a bike). Other facets of behavior are novel or unusual and may require setting aside well-practiced habits. The executive functions are central to the latter forms of behavior (Baddeley 1996; Luria 1973; Norman and Shallice 1986). They comprise a somewhat heterogeneous collection of cognitive abilities, including inhibitory control, set shifting, attentional flexibility, planning, self-regulation, impulse control, resistance to interference, error detection and correction, selective attention, focused attention, and working memory (Hughes 1998; Welsh, Pennington, and Groisser 1991; Zelazo et al. 1997). These skills are all involved in the monitoring and control of thought and action.

The development of executive functioning skills is tied to the maturation of the prefrontal cortex of the brain, and damage to this part of the brain causes deficits in these skills (Luria 1973). Deficits in executive functioning skills manifest in poor self-control and impulsivity, poor judgment in decision-making contexts, failure to organize and plan ahead, difficulty integrating prior knowledge with future goals, difficulty implementing strategies, perseveration with inappropriate behavior, difficulty sustaining attention, difficulty simultaneously processing multiple sources of information, and similar skills. People with attention-deficit hyperactivity disorder (Barkley 1997) and with autism (Russell 1997) show significant deficits in executive functioning skills.

Of all brain regions, the prefrontal cortex is the last to mature, and it continues to develop all the way through adolescence and into early adulthood (Diamond 2002; Hud-

speth and Pribram 1990; Huttenlocher 1990; Kwon, Reiss, and Menon 2002; Spear 2000). Thus, it is not surprising that the executive functions follow a protracted developmental course (Diamond 2002; Luciana et al. 2005; Passler, Isaac, and Hynd 1985; Posner and Rothbart 2000). They begin to emerge in infancy, develop markedly in the preschool years, and then again in middle childhood. Although many executive function abilities are relatively mature by early adolescence, they continue to be refined and consolidated throughout adolescence and into early adulthood (Anderson 2002; Zelazo and Müller 2002). Intriguingly, there is some evidence that certain executive functioning skills (e.g., impulse control, strategic behavior) regress to some degree at the onset of adolescence (Anderson 2002; see also Pechmann et al. 2005).

### Implications of Executive Function Development for Children's Ability to Cope with Advertising

The development of executive functioning skills should have an enormous impact on children's ability to process, cope with, and defend against advertising. Children may have a well-developed sense of the intentions underlying advertising, but unless they access that knowledge and keep it at the forefront, they may fail to guard against advertising's potentially adverse effects (John 1999). Immature executive functioning skills may render children vulnerable in several ways. They may be perceptually seduced by salient and pleasing, but largely irrelevant, audiovisual effects in advertisements (inhibitory control and resistance to interference). When their attention is captured in this way, they may have difficulty switching attention to more relevant, but often less salient, features of the advertisement, such as product quality, price, disclaimers, and persuasive intent (attentional flexibility). Information may come at them so quickly and through so many channels at once that they may have difficulty holding it all in mind (working memory). Finally, even if they have processed an advertisement effectively and know that claims about a product are likely to be inflated, on entering the marketplace, they may nonetheless purchase the product against their better judgment (impulse control and decision making).

Although executive functioning is usually considered a set of domain-general processing skills, these skills are also likely to interact with domain-specific content knowledge (Moses and Carlson 2004). The advantages that expertise in a specific domain confers have been well studied (Bedard and Chi 1992; Chi, Glaser, and Farr 1988; Glaser 1992). Compared with novices, experts have acquired more concepts in the relevant domain; their concepts are more closely interconnected, more abstract, and are processed more deeply; they more easily recognize and remember common patterns in the domain; they are more likely to plan and strategize their behavior; and processing in their domain of expertise is faster and more automatic. All of these advantages have the effect of generating a functional increase in information-processing capacity that can be devoted to executive processing.

The implication is that though a novice in a certain domain may show marked executive deficits, an expert in that domain is much less likely to do so. Thus, to the extent

that children possess expertise about advertising, they will be buffered against the effects of general executive function deficits on their ability to guard against advertising. The effects here are likely to be bidirectional: As greater expertise reduces the executive function demands in a domain, advances in executive functioning skills also facilitate the acquisition of expertise in that domain.

With respect to advertising, what kinds of expertise are the most relevant? A well-entrenched conception of the intentions underlying advertising is critical, as is an understanding of the specific tactics that advertisers use (e.g., exaggeration, special effects, use of celebrities). In regard to the latter, adults may be immune to the effects of some of these tactics. For example, people expect advertisements to emphasize positive features and, to some extent, to exaggerate them, and such an expectation may temper people's susceptibility to such tactics. Advertisers know this and, as a result, develop more subtle tactics that may be more effective. Over time, people may develop strategies to guard against these new techniques, leading advertisers to produce even more sophisticated tactics, and so on. Thus, a "persuasion-counterpersuasion arms race" develops (Sperber 2000). However, young children initially lack the relevant expertise about advertising tactics, and therefore, until they join this arms race, they will be especially susceptible to misleading advertising.

In addition to knowledge about advertising intentions and tactics, however, a well-developed appreciation of the role of advertising in the marketplace is critical. That is, a lay theory of marketplace economics may be as important in this context as a lay theory of psychology (i.e., a theory of mind). Unless children have some understanding of the profit motive, of the value of money, and of competition among brands, their general knowledge about advertising intentions may not protect them (John 1999). Children's appreciation of these concepts develops throughout childhood and into adolescence (Berti and Bombi 1981; John 1999; Webley 2005).

Furthermore, unless children have not only wide experience of different kinds of advertising and different kinds of advertising tactics but also substantial experience with the desirable and undesirable qualities of purchased products, their ability to focus attention on the most relevant aspects of advertisements will be limited. Product experience, and perhaps negative product experience in particular, seems crucial in grounding children's conceptual knowledge about advertising (Moore and Lutz 2000; Robertson and Rossiter 1974). Anecdotally, one of our own children once experienced a deflating discrepancy between what was claimed for a product (a fruit roll's ability to imprint a "tongue tattoo") and what was actually experienced. This salient negative outcome appeared thereafter to generate wide-ranging skepticism on his part about advertising claims (for more systematic findings of a similar sort, see Oates et al. 2003).

### Summary

Children's executive functioning skills follow a protracted course of development through infancy, childhood, and adolescence. The emergence and consolidation of these skills should greatly enhance children's ability to process and

cope with advertising. At least to some extent, the acquisition of marketplace expertise should offset immaturities in such domain-general abilities at younger ages.

## Directions for Further Research

We argue that theory and research on cognitive development can make an important contribution to our understanding of children's ability to negotiate their way through the world of advertising. Although we believe that a strong case can be made for this position, it will remain little more than a promissory note in the absence of theoretically driven research. We now discuss potential research directions that emerge from our review of the literature.

Our analysis suggests that the emergence of advertising concepts could parallel, or at least be dependent on, developments in children's theories of mind. For example, we argue that (1) recognition of the intent to sell should emerge soon after children recognize the role of desires in human action and interaction, (2) recognition of persuasive intent relies on an appreciation of second-order mental states, and (3) recognition of bias and promotional intent is unlikely before children acquire a genuinely constructivist theory of mind. Further research might test these predictions by examining whether children who have acquired the relevant theory-of-mind concepts also demonstrate better understanding of various measures of advertising knowledge (holding constant various control factors, such as age and verbal ability).

In a similar vein, we note that aside from Bartsch's seminal studies (Bartsch and London 2000; Bartsch, London, and Campbell 2005), there has been little basic research on children's knowledge of persuasion. Not much is known about what children of different ages understand about persuasion or persuasive intent outside of the advertising context. When do they recognize that other people may be trying to influence their mental states, or that people's biases may lead them to frame their persuasive arguments in one-sided and misleading ways, or that the need to persuade may generate promotional intent? A research program mapping out children's appreciation of various facets of persuasion is needed. It could then be determined how such an appreciation affects children's knowledge of persuasion in the advertising context.

There is also a need to map out systematically what executive functioning skills (and other relevant information-processing abilities) are necessary for effectively coping with different forms of advertising. We have offered some general suggestions to this end, but much more fine-grained analyses are required. After these analyses have been conducted, it will be possible to gauge more effectively the ability of children of different ages to cope effectively with advertising.

In addition, we suggest that children's expertise in the realm of advertising should interact with their processing skills, such that skills in one area may compensate for deficits in another. Such a possibility can be tested by systematically manipulating both conceptual complexity and processing complexity in advertising-relevant tasks and by relating children's performance on such tasks to independent measures of their expertise on the topic of advertising.

Moreover, it is known that there are marked individual differences among children in both their executive functioning skills (Kochanska, Murray, and Harlan 2000) and their theory-of-mind concepts (Repacholi and Slaughter 2003) and that such individual differences are also present in adulthood (Malle and Hodges 2005). It is also the case that there are strong relationships between executive function and theory-of-mind development in childhood (Carlson and Moses 2001). To the extent that such abilities underpin or facilitate children's advertising-relevant skills, we could expect to observe substantial group and/or individual differences in the latter skills. These possibilities could be explored in longitudinal research that maps out the relationships over time among variables such as theory of mind, executive function, and advertising-relevant skills. The issue is especially important because public policy regulations are almost always framed with respect to setting ages at which children might need some form of protection from advertising. Yet if substantial individual differences are indeed found in children's abilities to understand and cope with advertising, the use of age as a proxy for these abilities becomes problematic.

Finally, the place of children's advertising knowledge in a broader lay theory of economics should be more thoroughly explored. There is some research on children's conceptions of economics (Berti and Bombi 1988; Webley 2005) and on their economic behavior (Harbaugh, Krause, and Berry 2001), but there is relatively little research in comparison with the explosion of research in the past 20 years on children's naive theories of psychology, physics, and biology (see Wellman and Gelman 1998). Indeed, theory-based approaches have revitalized the study of cognitive development in that period, generating a wealth of knowledge about children's understanding and how it develops in different domains. By capitalizing on some of the theoretical and methodological advances that have emerged in the study of these other domains, research on children's naive economics might prove similarly fruitful.

## Conclusion

Reviews of the literature on children and advertising frequently note wide variance in the age at which various studies suggest that children distinguish between advertisements and programs and the age at which children understand different forms of persuasive intent (Gunter, Oates, and Blades 2005; John 1999). It is argued that much of this variance is a product of methodological differences across studies. Sometimes, verbal explanations are the dependent variable, whereas other studies use more implicit, nonverbal indexes. The implication in these reviews is often that the verbal methods provide a misleading, overly conservative estimate of children's abilities in this area. For example, Pine and Veasey (2003) draw on Karmiloff-Smith's (1992) distinctions among implicit, explicit, and verbal understanding and suggest that implicit, nonverbal methods reveal early forms of advertising knowledge in children.

In our view, however, a reliance on such methods may not be appropriate in this context. Certainly, it is of great theoretical interest to determine when the first glimmerings of a concept begin to emerge in implicit form. However, it

is much less clear whether this is the appropriate criterion for public policy decisions about the age at which children might need protection from advertising. In our view, a better criterion should be derived from an assessment of how well entrenched children's advertising concepts are, how flexibly they can deploy these concepts in real-world contexts, and the extent to which their subsequent behavior is guided by these concepts. Merely having the concepts in some latent form does little if anything to prevent children from being led astray by advertising.

We suggest that children's understanding of some aspects of advertising is present in early childhood. However, we also suggest that immaturities in their executive functioning skills limit the extent to which children can make use of these concepts until much later in development. Moreover, our review has been limited to traditional television advertising. However, the executive challenges posed by increasingly subtle and/or sophisticated forms of advertising (e.g., merchandising, infomercials, Internet advertising) may be substantially greater. Although public policy research on children and advertising has focused heavily on the emergence of various advertising concepts, we urge that equal emphasis be placed on their ability to put these concepts to use in their everyday lives.

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