Abstract

In this paper, we discuss and present different theories and multiple empirical examples of how children develop their food preferences, how their understanding of and resistance to persuasion and marketing messaging may develop, and how their consideration and choice sets change over time. Overall, the findings we present suggest that firms, consumers, and parents can benefit from taking these changes into account when making choices that affect children and when allowing children to make their own choices.
Persuading Children: Long-Lasting Influences on Children’s Food Consideration Sets, Choices, and Consumption

1. Introduction

Although there is often a view that children have little spending money and no decision power, in actuality the size and importance of industries in the world today in which children have a decision role is overwhelming: the global market for toys and games was well above US$100 billion in 2013; in the United States alone, the food industry specifically targeted at children is expected to grow from $23 billion in 2013 to $30 billion in 2018; and, on average, children spend 57 minutes watching television each day, with exposure to an average of more than 100 ads per year for soft drinks alone (Statista, 2015). These examples provide ample motivation for the need to understand the multiple short and long-term influences on children’s product-related choices.

Broadly speaking, our goals for this piece are to advance the literature on the development of consideration and choice sets in children, discuss how children are persuaded by messages and behavior of parents and firms, and increase understanding of how children make choices at different stages of life. We do not aim to be fully inclusive in terms of literature across different fields. Rather, we show through different theories and multiple examples that, as children develop, their understanding of and resistance to persuasion and marketing messaging changes, and, at the same time, influences on their choice sets likewise change. Firms, consumers, and parents may benefit from considering these factors when making choices that affect children and when allowing children to make their own choices.

Although the arguments made in this paper are likely to apply to many product categories, we focus our attention on food as a case in point. This category was purposefully chosen because it is a category where children either have a dominant impact on choice or because experience and environment, early life behavior and decisions, and persuasion of children in food categories have been shown to have significant long-term consequences. In addition, one of the most important concerns in many countries is child obesity. In the United States, the average rates of obesity in children and teenagers went up from around 5% in 1971-1974 to around 18% in 2011-2012 (National Health and Nutrition Examination Survey, 2012). Although the numbers have recently
fallen in some states, they have continued to increase in others and the overall prevalence of childhood obesity remains alarming (Centers for Disease Control and Prevention, 2016). Given the current substantial rates of overweight and obesity in kids and implications for negative health outcomes, better understanding of children’s choices of food is of significant importance.

The following five sections of this paper focus on influence and persuasion, consideration sets and choices, and marketing influences and ordered by age, from infancy to adulthood. We then conclude with a summary of main managerial implications and several directions for future research.

2. The Development of Food Choice Sets in Infants

At the very beginning of life, children do not make decisions: because infants are born immature, physiologically and psychologically, their choice decisions are made by their caretakers. However, experience received during this early period is essential for later choices and lasting eating habits; early childhood clearly appears as a window of opportunity for the development of healthy eating behavior (Schwartz, Scholtens, Lalanne, Weenen, & Nicklaus, 2011). More specifically, both experimental and epidemiological data suggest that the first thousand days of life, from conception to the second birthday, constitute a critical period because the conditions in which the infant will grow are likely to have a strong impact on health outcomes later during childhood and into adulthood.

These findings has led to the development of the concept of Development Origin of Health and Diseases (DOHAD), which conceptualizes that the health status of an adult is rooted in developmental events, in particular related to nutrition (Garmendia, Corvalan, & Uauy, 2014). Interestingly, during early childhood, important maturation processes happen, with many transitions taking place in a very short time frame: for example, from feeding from the cord in utero to milk feeding after birth, and the initiation of complementary feeding at about mid-course of the first year. At the end of the complementary feeding process, the child will ultimately eat food from his cultural and familial context.
Within a short period, children learn many aspects of eating behavior: how, what, how much, when, with whom, and in what contexts to eat. This strong socialization process is influenced by parents and other caregivers. Over the course of the second year, food neophobia, i.e. the fear and avoidance of new foods, develops and may affect up to three quarters of children by two years of age (Cashdan, 1994; Dovey, Staples, Gibson, & Halford, 2008; Nicklaus, 2009). Consequently, this limits the expansion of consideration sets and decreases variety seeking (Nicklaus et al., 2005). This change in behavior highlights the importance of understanding the mechanisms at play during this period, that contribute to early eating habits, to understand the grounds on which decision making will form later in childhood.

The acceptance of foods at the initiation of the complementary feeding period can be influenced by the method of milk feeding (breast vs. bottle). Breast or bottle feeding can influence acceptance of foods in a variety of ways: the feeding method may modify the development of food and flavor acceptance, of oral feeding skills, and of infant control of energy intake (Nicklaus, 2016a). Once solid foods are introduced, several factors influence children’s liking of these foods.

Repeated Exposure

Repeated exposure to a food is one of the primary determinants of its acceptance. Whatever the type of stimulation (auditory, visual, etc.), repeating exposure to a stimulus increases its familiarity, which is associated with a shift in hedonic judgment (Zajonc, 1968). This holds true for foods; an increase in familiarity with a food reduces neophobic reactions and increases hedonic evaluation in children (Birch, McPhee, Shoba, Pirok, & Steinberg, 1987) as well as in adults (Pliner, 1982). In infants, several studies have shown that a food is consumed more and is judged as more liked by an infant after several offers; an increase in acceptance of a new vegetable or a new fruit occurs after eight to ten exposures (Birch, Gunder, Grimm-Thomas, & Laing, 1998; Sullivan & Birch, 1994). The effect of repeated exposures is potent enough to increase even the acceptance of foods which had been previously identified by the mother as being refused by her infant (Maier, Chabanet, Schaal, Issanchou, & Leathwood, 2007).
Repeated exposures provide opportunities to become familiar with the sensory properties of the food. With repeated exposure, a liked sensory feature of the food may increase the hedonic reaction toward another sensory feature of the food, through a conditioning mechanism; this is generally described as flavor-flavor learning. Additionally, the consequences of the ingestion of a food may also condition the acceptance of its sensory properties; this is described as flavor-nutrient learning (Yeomans, 2012). In infants and young children, repeated exposures are as effective as associating a new vegetable with a liked flavor (e.g., sweetness) to increase its intake, while associating it with a higher energy content (e.g., addition of oil) did not increase its intake, probably because of learned satiation (Caton, et al., 2013; Caton, et al., 2014; Remy, Issanchou, Chabanet, & Nicklaus, 2013). This suggests that the repeated exposure mechanism is as effective as and simpler than implementing flavor-flavor learning and more effective than flavor-nutrient learning for increased vegetable acceptance.

Another factor that contributes highly to the acceptance of a new food and expands a child’s consideration and choice sets at early stages of life is the extent to which the child has been exposed to a variety of foods. Six-month-old infants more readily accept a new food, either if they have been repeatedly exposed to it or to a variety of other foods differing from one day to the next, than if they have been repeatedly exposed to a single, previously familiar food (Gerrish & Mennella, 2001). Offering different pairs of foods from one day to the next also enhances acceptance of new foods (Mennella, Nicklaus, Jagolino, & Yourshaw, 2008). Variety both in different foods from one day to the next (Maier, Chabanet, Schaal, Leathwood, & Issanchou, 2008) or within a meal (Mennella, et al., 2008) have been shown to increase vegetable and fruit acceptance. Moreover, this benefit of introducing a variety of vegetables at early stages is long-lasting and remains at least up to the age of six years old (Maier-Noth, Schaal, Leathwood, & Issanchou, 2016).

*Impact of Quality of Mealtime Context and Parental Responsive Feeding*

Acceptance of different food including fruits and vegetables may be learned in interaction with contextual signals from the eating environment. Since infants and young children are not able to self-feed, nor to make appropriate food choices by themselves, all their meals take place in a social context with at least one caregiver present. Caregivers thus determine the types of foods children are
exposed to and thus caregivers’ choices and feeding practices shape early learning through the mechanisms previously described.

Exposure to fruits and vegetables may be associated with parents’ emotional signals as well as verbal instructions; these are likely to influence the child’s eating behavior, and possibly enjoyment of the food consumed (Satter, 1990). Social interactions can impact children’s behavior quite early: an experimental study conducted with American participants showed that the volume of formula ingested by infants aged 7 to 14 weeks was higher in situations with social interactions (Lumeng, Patil, & Blass, 2007). The quality of social interactions is also likely to be associated with a differential acceptance of foods. For instance, parenting style is as likely to impact the child’s enjoyment of eating as the food itself: a survey conducted in France showed that parents who were the most permissive in terms of child feeding had young children with higher levels of pickiness and neophobia, lower appetite, and enjoyment of foods (Rigal, Chabanet, Issanchou, & Monnery-Patris, 2012). Past reviews have synthetized the role of parenting style (Vollmer & Mobley, 2013) and other feeding practices on the development of eating behavior (Issanchou & Nicklaus, 2014), focusing on the role of external reward given by parents on food acceptance in children according to the type of rewards (Cooke, Chambers, Añez, & Wardle, 2011) and on the association between parenting style and fruit and vegetables consumption (Blissett, 2011).

The importance of these interactions in the feeding situation was long recognized by Satter in the “Division of Responsibility” approach, which states that “parents manage the what, when, and where of feeding and allow children to determine the how much and whether of eating” (Satter, 1990; Satter, 2014). This social aspect of eating is further taken into account in the concept of responsive parenting, and in particular of responsive feeding, which reflects reciprocity between the child and the caregiver, and is now viewed as a promising way to promote healthy eating habits (Black & Aboud, 2011). Intervention trials recently showed that providing parents with an educational approach to promote responsive parenting is associated with healthier (slower) weight gain in the first year (Savage, Birch, Marini, Anzman-Frasca, & Paul, 2016). Thus, responsive parenting practices may be a promising way to promote healthy learning. More intervention trials in this area should help to understand whether providing information about responsive parenting may affect
feeding practices, children’s preference for healthy foods, and ultimately the children’s health status in a variety of cultural contexts.

3. Child Behavioral Development and Early Understanding of Marketing

Moving now to the years that follow infancy, we focus our attention on an additional source of information and influence on children’s choice sets: marketing messages and persuasion in advertising. The literature has been somewhat divided in terms of the ability of children to understand persuasion and the influence of marketing messages on choices. For several decades, child development was assumed to progress through fairly rigid stages. Using a Piagetian approach to understanding children’s development, many researchers assumed that preschool children were incapable of thinking about the thoughts of others (such as the intentions of an advertiser). Numerous studies have highlighted the preschool years as a period in which children are “information sponges”, ready to soak up information from their environment but not yet sophisticated enough in their development to employ cognitive defenses such as skepticism or critical thinking (e.g., LaPierre, 2015; McAlister and Bargh, 2016; McAlister and Cornwell, 2009, 2010, 2012; Moses and Baldwin, 2005). For example, early literature assumed that a child who viewed a commercial that employed a cartoon character was unable to differentiate the commercial from a cartoon (see John, 1999 for review).

In response to Moses and Baldwin’s (2005) call for research to delve deeper into understanding children’s cognitive development, several researchers began to examine the link between children’s development in certain areas of socio-cognitive functioning and their market savvy. Of interest is the extent to which certain consumer competencies, for example, the ability to detect selling intent, the ability to understand how collectible sets work, and the ability to understand the concept of branding might be explained by individual differences in children’s theory of mind and executive functioning development rather than strict, age-based developmental stages. Theory of mind refers to an individual’s ability to think about the thoughts of others and use mental representations of another person’s thoughts and feelings to theorize about the other’s likely future behaviors (Chaplin and Norton, 2015; McAlister & Peterson, 2013, 2007; Wellman, Cross and Watson, 2001).
As an example of theory of mind, let’s suppose that if Zoe likes dogs but knows that James fears dogs, Zoe can predict that James might run away if he sees a dog. However, if Zoe’s theory of mind is not yet developed, she might know that James does not like dogs but would fail to employ that knowledge to successfully predict James’ behavior around dogs. In the absence of a developed theory of mind, Zoe would expect James to pet a dog because that is what she would do. Prior to developing theory of mind, such errors are common among young children. Around age three, however, children begin to show signs of emerging theory of mind and by age five many children will know that others have different thoughts and attitudes (Wellman et al., 2001).

Given that the preschool years are a time during which theory of mind is mastered, it makes sense that this would be the period during which children first show signs of recognizing selling intent in commercials. Indeed, this is what multiple researchers have confirmed. McAlister and Cornwell (2009) reported that children ages three to five show emerging abilities to recognize persuasive intent in advertising. In their sample of preschool children, the ones who were most successful at detecting persuasive intent in print advertisements were those with the most advanced theory of mind. These findings were not unlike those of Donahue, Henke, and Donahue (1980), who found that preschool children could detect selling intent in television commercials.

In a separate study, McAlister and Cornwell (2010) also found that theory of mind was a significant predictor of preschool children’s ability to recognize the social symbolism of brands, controlling for language ability. When asked questions that tap children’s understanding that brands may serve to communicate an individual’s social status, children with more advanced theory of mind development were more apt to understand the social symbolism. For example, when asked a question about popularity, children with more advanced theory of mind development would give answers reflecting their understanding that consumption of branded products conveys social meaning. For example, when asked “If another child has McDonald’s for lunch will he have lots of friends or not a lot of friends?” children with more advanced theory of mind gave answers such as, “He won’t have many friends because McDonald’s makes you fat and nobody likes you” or “He will have lots of friends because McDonald’s have a playground and all your friends can play”. Children with less advanced theory of mind development were more likely to give answers reflecting their lack of understanding of the social symbolism of branding (e.g., “He won’t have friends because he doesn’t like them.”).
Some preschool children are more adept at understanding the concept of branding than others. For example, when given a deck of cards with images of McDonald’s products and merchandise, Burger King products and merchandise, and other items, some preschoolers can sort the cards into three piles – McDonald’s items, Burger King items, and “other” items (McAlister and Cornwell, 2010). The children who are most adept at this task are those with more advanced theory of mind and more advanced executive functions. Executive functions include a set of cognitive skills including impulse control, working memory, planned behavior, and categorization skills (Garon, Bryson, and Smith, 2008; Moses and Baldwin, 2005). It makes sense that advanced executive functions would enable children to sort products and merchandise per their brands. Likewise, the relationship of theory of mind to the understanding of branding as a concept makes sense because the development of theory of mind is a form of development that involves mental representations as does understanding the concept of brands.

Both theory of mind and executive function have been found to play unique roles in children’s collecting behavior and their motivations to pursue completion of collectible sets of toys (McAlister, Cornwell and Cournain, 2011). Taken together, these findings across multiple studies highlight the fact that numerous areas of socio-cognitive competencies and consumer competencies are budding during the preschool years. These findings are consistent with numerous suggestions in the developmental psychology literature that, during the preschool years, development occurs in leaps and bounds (see McAlister and Peterson, 2013; Moses and Baldwin, 2005).

However, as noted by Moses and Baldwin (2005) and McAlister and Cornwell (2009), there is no evidence to suggest that critical thinking skills are mastered at this early age. Quite the opposite is suggested by McAlister and Cornwell (2013) who describe preschool children as “information sponges” and argue that children ages three to five are particularly vulnerable to the persuasive influence of marketers. Moses and Baldwin (2005) articulate this vulnerability clearly by explaining that children’s social skills develop much more rapidly than their executive functioning skills. In fact, it is later that children’s understanding of the social symbolism of brands develops such that they begin connecting brands to their self-concepts in middle childhood and increasingly connect and use brands to communicate their self-concepts through adolescence (Chaplin and John 2005).
Since advanced executive functioning is needed to fully develop skepticism and to resist persuasive calls to action from others, the protracted development of these functions, which typically don’t mature fully until late adolescence or early adulthood, can render children vulnerable to persuasion for most of their childhood years.

4. Persuasion and Children Food Choices

Understanding how young children make choices and respond to persuasion – from parents and other caregivers and from brands and firms - is crucial given the importance to learning to make healthy choices from an early age (John, 1999). The increased exposure of children to food and non-food advertising only increases its importance (Desrochers and Holt 2007; John 1999; Powell, Szczypta, and Chaloupka 2007).

At pre-school age, children start receiving messages that frame products as having more than just a unique function - for example, food having a role of improving health, strength, or intelligence - or messages related to scarcity of resources and the size of the choice set. Building on the distinction between instrumental and experiential benefits and the means-goal dilution phenomenon (Fishbach and Choi 2013; Zhang, Fishbach, and Kruglanski 2007), Maimaran and Fishbach (2014) show that presenting food as instrumental to achieving a certain goal (e.g., making children healthier, helping them count better, or helping them read better), casts doubt on an obvious goal the food needs to serve (i.e., being tasty), and in turn, decreases consumption of that food. For example, in one of the studies, children in the “goal” condition heard a story about a girl who likes to eat carrots and thinks that carrots will help her count better. In the “control” condition children were just told that the girl likes to eat the carrots. When later offered carrots, the three- and four-year-old children in the “goal” condition ate about half the amount compared to children in the “control” condition.

Different forms of direct persuasion can increase consumption of healthy food. For example, Maimaran and Salant (2017, working paper) show that presenting items as scarce can increase the desirability of these items. In one study, the authors served four- and five-year-old children a bowl with carrots and found that merely telling these children that there was a limited amount of carrots
increased the amount of carrots that these children ate compared to a control condition in which children were not told the scarcity message.

More subtle routes of persuasion can also affect children’s decision making. Given young children’s sensitivity to visual cues, Maimaran and Salant (2017, working paper) also investigate how visual cues of scarcity, such as presenting certain items as the minority in the choices set, can increase the desirability of these items and increase the probability of choosing them. For example, when there is a smaller number of grape boxes in the choice set compared to a larger number of cracker boxes, four-and-five-year-old children are more likely to choose grapes over crackers compared to when there are equal numbers of grape boxes and cracker boxes. Presenting items as the minority can affect choices not only in the food domain, but also among toys and stickers. For example, when presented with a set with two red stickers and five green stickers most children choose the red sticker. But when the green sticker is the minority, most children choose green.

Children’s healthy choices can take form not only through the food they choose to eat, but also through the activities they choose to engage in. Maimaran and Salant (2017, working paper) find that scarcity cues can affect children’s engagement with various tasks and show that presenting a playing activity as limited in time increased the time children spent playing. Children’s engagement can also be influenced by the number of options children are choosing from. Ample research with adults shows that choosing from a large, compared to a small, set is more difficult, can lead to decreased satisfaction with the chosen option, and reduced engagement (Botti & Iyengar, 2004; Iyengar & Lepper, 2000), though not much research looked at the effect of the size of the choice set on engagement, and especially not among young children (notable exceptions are Zeinstra et al. 2010 and Maimaram, 2017).

5. The Impact of Contextual Factors on Food Choices and Consumption in School-age Children

Adults have been shown to be susceptible to a variety of context effects. Relevant to our current focus, it has been shown that adults choose and eat more energy-dense, low-nutrient food after seeing others who are overweight, and after seeing overweight others choose a lot of such food
(Campbell & Mohr, 2011; McFerran, et al., 2010; Doering & Wansink 2015). On the one hand, the earlier discussion on the development of theory of mind and executive function suggests that children will likewise be susceptible to environmental effects. On the other hand, these particular effects are based on stereotype knowledge of the overweight, so children must have such stereotypes in order for the effects to occur. Body-based stereotypes begin to appear between 3 and 5 years of age, with children developing a series of physically-based stereotypes about the role of gender (Signorella, Bigler & Liben 1993), associations with racial group (Brand, Ruiz & Padilla 1974), and attitudes and associations with certain body builds (Cramer & Steinwert 1998; White, Maura & Spindler 1985) during this period of development. Like adults, children 5 to 14 years old (the ages examined) are found to be susceptible to priming effects and to consume more energy-dense, low-nutrient food (e.g., cookies) when exposed to images of apparently over-weight make-believe characters (Campbell et al., 2015).

Primary school (8 to 11 year old) children’s food choices may be modified by relevant information about health (Marette et al., 2016). Although this is encouraging, it is important to note that young children have processing limitations; for example, children (9 year olds) do not use persuasion knowledge unless it is accessible at the time (Brucks, Armstrong, and Goldberg, 1988). In line with this, priming children’s pre-existing health knowledge limited the impact of overweight characters on consumption of low nutrition value food (Campbell et al. 2015). When kids were exposed to an overweight cartoon character, they chose and ate more high energy, low nutrition food, but priming pre-existing health knowledge prior to exposure to the cartoon character buffered this effect on children’s choices such that children with accessible health knowledge did not eat more cookies than children who saw a normal weight character (Campbell et al 2015).

A large and increasing amount of the marketing to children uses licensed characters, such as Sponge Bob Square Pants, Dora the Explorer, Mickey Mouse, etc. in advertising, on packaging, on websites and more. There is limited research, however, on the impact of the use of licensed characters on children’s consideration sets and choices. One study found that four to six-year-old children rate a snack higher when it is presented in a bag with a sticker of a licensed character than when there is no character in a within-subject design (Roberto, Baik, Harris & Brownell, 2010). In a between-subject experiment with four to six-year-old children, unhealthy cereal from a package without a character
was rated as less tasty than the unhealthy cereal with a character or the cereal when they were told it was healthy, regardless of the presence of the character (Lapierre, Vaala & Linebarger, 2011). Neither study examined consumption. Thus, the relationship between characters and children’s food preferences and/or consumption remains uncertain.

Leonard, Campbell and Manning (2017, working paper) examine multiple hypotheses relating a licensed character and the impact on choice and consumption: (1) affect transfer, where kids like the character, they associate it with the food, and so they like the food more and thus consume more; (2) the character could change the perception of the food, which could then impact liking/consumption; and (3) kids want the character, so there is an increase in choice, but not liking or consumption. This research finds strong effects of a licensed character on choice of both healthy (e.g., apricots or raisins) and unhealthy (e.g., cookies or gummy chews). However, while there is an increase in choice of the product with the character, there seems to be little to no impact on taste evaluations or, importantly, consumption. These results suggest that children want the product with the licensed character, but that the character does not impact their liking for the product itself.

6. The Impact of Early Age Marketing Messages on Teenager and Adulthood Food Decisions

As children become teenagers and young adults, the general motivation theories of hedonic consumption and external rewards come further into play. This especially happens when products are bundled to create a larger appeal, for example, bundling food with toys/games, or also in other categories by bundling education with games to increase engagement and motivation to perform (e.g., Akchurina and Albuquerque, 2017, working paper). In addition, for teenagers, products offer complex reward systems and loyalty programs based on targets and levels or access to games as rewards, which appear to work well to motivate the long-term usage of products by teens (e.g., Nevskaya and Albuquerque, 2016, working paper). In food categories, these motivation strategies are also likely to work well.

Various studies have evidenced that food promotion imposes a significant influence in teenager’s consumption behavior (Cairns et al., 2009). For example, two studies investigated adolescents’
receptivity to appeals used in social marketing advertisements advocating healthy eating and found that news and fear appeals are more effective than love or popularity (Chan, Prendergast, Grønhøj, & Bech-Larsen, 2009; Chan & Tsang, 2011). In addition, an experimental study also found that an advertisement using a threat appeal was more effective than one using a fun appeal in promoting healthy eating among pre-adolescent participants (Charry & Demoulin, 2012).

In another example, from a qualitative study conducted in Changsha, China, researchers investigated how marketing communication influences teenagers’ food consumption behavior. Using focus groups, participants were asked to report their favorite food and beverage advertisements, and explain why they liked them. Following this, participants were requested to recall promotional tools that influence their food consumption behavior. Results indicated that entertainment value of advertisements, memorable jingles and slogans, and use of celebrities were main attributes of the advertisements that could generate communication effectiveness and encourage food trial (Chan et al., 2015).

The other persuasive advertising execution that influenced purchase behaviors was the use of celebrity endorsers. Participants frequently reported popular mainland Chinese and South Korean celebrities in food and beverages advertisements encourage them to try the endorsed brands. They could recall the names of the celebrities, the brand name of the food product, and how the celebrities interacted with the brand. The finding that use of celebrities in advertisements in triggering trial was similar to that found among adolescents in Hong Kong (Chan, Ng, & Luk, 2013). Using young, stylish, good looking, dynamic personalities on screen captures the attention of young consumers and allows the brands to associate the image of the celebrity with the advertised product, creating a positive feeling for the brand. An open question is when adolescents develop the more nuanced and skeptical responses to celebrity endorsers seen in adults (e.g., Campbell and Warren 2012).

Besides traditional advertising, teenagers’ food consumption was also influenced by a variety of promotional tools. Teenagers are often attracted by offerings of food tasting at retail stores, sales discounts, on-pack premiums, and sales promotions such as buy one get one free offers. They also appreciated food products in packaging of special designs (Chan et al., 2015).
Another important influence on teenager and adulthood decisions comes from the long-lasting effects of marketing messages that were received during early in life. Early life messages may influence teenager and adult decisions for several reasons: (1) brand names and category associations learned early in life are recognized more quickly and accurately than those acquired later in life (Ellis, Holmes, & Wright, 2009); (2) early acquired concepts are more firmly embedded in semantic memory than are later acquired concepts (Steyvers & Tenenbaum, 2005); and (3) early acquired concepts shape neural networks into an efficient form for representing them, resisting attempts at reconfiguration by later-learned concepts (Ellis & Lambon, 2000).

Advertising to children typically includes fun and happiness as the most common primary appeals (Kunkel & Gantz, 1992) and, as we discussed before, young children are unlikely to consider advertiser motivations or to immediately integrate these understandings with multiple product dimensions into their processing of advertising messages (e.g., Bahn, 1989). This leads to a positive bias about brands and messages received. In addition, prior to age seven, even considering the theory of mind developed more recently and previously discussed, some children still do not make relevant distinctions between advertisements and television programming (Butter et al., 1981; Palmer & McDowell 1979, Ward, 1972). In middle childhood, children acquire an understanding of the purpose of advertising, but do not spontaneously apply skepticism when faced with advertising (Brucks, Armstrong, & Goldberg, 1988). In general, children begin to process advertisements in an adult-like manner at about age thirteen (Boush, Friestad, & Rose, 1994).

A child’s extant abilities at the time of initial encoding of advertising into memory can affect how this advertising is remembered and used throughout one’s lifetime because of early acquisition effects with high repetition and hedonic associations and likely halo effects. This results in brand beliefs and judgments in adulthood that are likely to be biased in an affect-congruent direction, globally benefiting the product across many attributes (Batra & Stayman, 1990; Isen et al., 1978; Isen & Shalker ,1982; Mackie & Worth, 1989). Biases accompanied by highly positive affect may be resistant to correction (Ahluwalia, Burnkrant, & Unnava, 1997). Corrections for biases are most likely to occur when people have the ability and motivation to reconsider beliefs (Wegener & Petty, 1995). Even when people develop the ability to reevaluate childish brand beliefs, the positive affect associated with some highly advertised brands leads to low motivation to reconsider those beliefs.
In such cases, people tend to use the knowledge that is most accessible to them in forming judgments (Higgins, Lombardi, & Bargh, 1985; Feldman & Lynch, 1988; Smith, 1990; Wyer, 2008).

Connell, Brucks, and Nielsen (2014) examine the resiliency of these biases in judgment by utilizing two known correction techniques: cognitive goal structures, i.e., by making negative attributes of associated products accessible (Bargh et al., 2001) and activating advertising knowledge for cognitive defense against marketing communications (Brucks et al., 1988; Campbell & Kirmani, 2000).

Connell, Brucks and Nielsen (2014) find that exposure to advertisements in childhood can lead to biases in favor of the advertised product in adulthood. Moreover, positive affect toward advertising elements (e.g., characters) causes biases to persist. Connell et al. (2014) report that biases can be traced to advertising, over and above fond memories of consumption. These biases are resilient for people who have positive feelings for a product, but can be corrected for others when ability and motivation to correct are enhanced. Adults with high positive affect do not respond to known bias correction techniques: priming cognitive goal structures, i.e., by making negative attributes of associated products accessible (Bargh et al., 2001) and activating advertising knowledge for cognitive defense against marketing communications (Brucks et al., 1988; Campbell & Kirmani, 2000). Furthermore, Connell et al. (2014) demonstrate that biases are not limited to the original product, and can transfer to brand extensions.

Building on this research, Connell, Nielsen and Brucks (2017, working paper) find that distinctions between childhood advertising and entertainment are blurred in adult’s memory structures, and that these blurred distinctions are an independent mechanism that also leads to biased product evaluations.

7. Conclusion and Future Research

In this paper, we discuss the evolution of consideration sets, choices, and consumption from infancy to adulthood. Starting at infancy, the first 1,000 days are a window of opportunity to shape future choices, as infants offer little resistance to trying new food prior to the age of 1 to 2 years. This is a
time that parents (and firms) can use to create a liking for variety and the build-up of a large consideration set in infants that will likely last until adulthood. The main reason for low opposition by children to trying new products and food is the fact that neophobia – the fear of new things – does not become prominent until the second year of life. The creation of consideration sets that are varied and large in infants is of significance because, for example, eating behavior at ages two and three was found to predict eating behavior up to early adulthood (e.g., Nicklaus, et al., 2004, 2005; Nicklaus and Remy, 2013).

Consequently, for future research, we believe that more effort needs to be implemented with a focus on understanding the factors that influence the early development of eating behaviors, for example in complementary feeding. Although there is significant literature that has found that the pleasure of eating, variety, repeated exposures, sensory properties, and attitudes towards foods - in normal vs. overweight children - increased the acceptance of new food in infants and young children (e.g., Maier et al., 2007; Remy et al., 2013; Caton et al, 2014), more research is needed to get closer to understanding the full impact of early decisions on later food choice sets.

At later developmental stages, children’s choices may be influenced by a variety of factors, just like adult’s choices are (Contento, Randell, & Basch, 2002) and cultural norms are likely to shape their attitudes about food (Monnery-Patris et al., 2016). Food choices are heavily grounded on biologically determined physiological predispositions, as well as strongly shaped by experience with food, thanks to learning mechanisms described in detail elsewhere (Nicklaus, 2016b). These important contributions of biology, learning and memory are important to keep in mind when trying to address food decision making in children, especially in young children. Critically, we also see that environmental factors significantly impact children’s food choice and consumption, and greater understanding of such factors is important to help parents and other caregivers create environments that help children learn to make healthy choices and to exercise self-control. Understanding how to increase children’s choice and consumption of healthy food and the engagement with productive activities is especially critical given the increase in obesity rates and the generalized use - even by infants - of mobile devices for non-educational purposes (American Academy of Pediatrics, 2013), and the effect using these devices has on children’s development of various skills such as self-regulation skills (Radesky, Schumacher, & Zuckerman, 2015). Studies that advance the knowledge
of how to persuade children and parents towards better decisions are needed, especially to justify and select best public policies.

As mentioned in the main part of the paper, children have a developmental difficulty in effectively coping with advertising, which leads to memory representations that are based on childhood understandings. In many cases, children confuse sponsored advertising with entertainment content, leading to a blurred distinction between advertising and entertainment in long term memory. Furthermore, the strongly hedonic content of children's advertising creates affective associations in long-term memory, but without the skeptical thinking typical of adults. Furthermore, material parenting by adults (Richins and Chaplin 2015) reinforces powerful brand messages. All these forces lead to a failure to fully apply developing advertising knowledge in later years, resulting in biases that can influence choices made as adults (Connell, Brucks, and Nielsen, 2014). In other words, the understandings and feelings of a gullible child exposed to sophisticated advertising can live on in the adult consumer.

We conclude by saying that, given all the discussed literature, it is important to continue to develop measurements of the effects of experience, early choice decisions, and exposure to advertisements, packaging, and other factors in childhood on persistent behaviors and judgment biases in adulthood. Only through the understanding of the simultaneous effects of these forces can researchers and policy makers help children and parents make better decisions.
8. References


