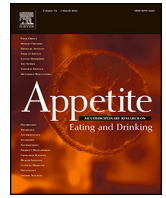




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Research report

It's always snack time: An investigation of event scripts in young children.

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ABSTRACT

This study examined whether young children include eating in their cognitive scripts for various events, and whether food-related scripts are associated with body mass index (BMI) percentile. Data were collected in a structured interview format. Participants, recruited from area preschools and day cares, provided a four-activity sequence for each of three events, and responses were recorded verbatim. Forty-four children (45% female) participated, with an average BMI percentile of 73.3% ($SD = 25.9$). Data were binarily coded to indicate whether each response was food-related. Frequencies were obtained, and responses were correlated with BMI percentile. Over 22% of the activities in the children's scripts involved food. The number of food-related activities reported was positively correlated with children's BMI percentile ($r = 0.53$, $p = 0.03$). Results provide preliminary evidence that food features prominently in young children's event scripts and that children with higher BMI percentiles may possess scripts that feature more food-related themes. Future researchers should investigate the causal nature of this relationship.

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Introduction

According to the World Health Organization (WHO), in 2010 more than 42 million children worldwide under the age of five were overweight (World Health Organization, 2013). In the United States, the prevalence of obesity among children 4–6 years old was recently estimated to be approximately 15% (Castetbon & Andreyeva, 2012), which parallels the National Health and Nutrition Examination Survey-based estimate that 16.9% of children in the 2–19 years age bracket are obese (Ogden, Carroll, Kit, & Flegal, 2012). Because overweight and obesity have been identified as risk factors for a number of chronic diseases and health problems, as well as social and psychological consequences, the WHO identified prevention as a high priority, and formed the WHO Global Strategy on Diet, Physical Activity, and Health in 2004 to address the high rates of overweight and obesity (World Health Organization, 2014), which are viewed as highly preventable (World Health Organization, 2013).

One avenue to prevent and treat childhood overweight and obesity is to address child caloric intake and dietary quality. A recent review by Kuhl, Clifford, and Stark (2012) cites a number of ways in which the food environment impacts child diet and weight status. The authors emphasized that the food environment interacts with parental feeding practices and young children's eating behaviors. Poor eating habits that children develop, which endure over time,

combined with sedentary behavior, contribute to childhood overweight and obesity (Schwartz & Brownell, 2007).

Changes in the food environment are likely associated with a shift in children's expectations about when and where eating typically occurs. Children today consume more calories and eat more frequently than children did 30 years ago (Popkin & Duffey, 2010). This is related to an increase in the frequency of snack consumption and an increase in overall calorie consumption among children (Jahns, Siega-Riz, & Popkin, 2001). One study found that for school-age children, "snacks account for 27% of total daily calories, which is more than the calories consumed at breakfast (18%) and lunch (24%), but not dinner (31%)" (Roblin, 2007).

If children are eating more calories and eating more frequently today than in the past, it is likely that they view the consumption of food as relatively more normal and appropriate across a greater variety of contexts and situations than children in the past. When individuals experience events frequently, they develop cognitive scripts (also known as mental schemas) for these events, which represent the typical order and type of events that occur in a particular situation or context (Abelson, 1981; Siegler & Alibali, 2005). Abelson (1981) defines scripts as "conceptual representations of stereotyped event sequences" that involve "expectations about the order as well as the occurrence of events." A common event during a specific situation or context is more likely to be represented in an individual's event script for that situation or context. Because scripts can influence future behavior, and can be influenced by past behavior, understanding the food-related content of children's scripts is especially important in understanding children's food intake. Thus,

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the goal of the current study is to investigate the extent to which children's scripts for various events include food intake.

There is evidence that children as young as two possess cognitive scripts, as indicated by their ability to express knowledge of event sequence (Sell, 1992). By the age of three, children can reliably reproduce an ordered sequence of events in a scripted format (O'Connell & Gerard, 1985). For older children, script acquisition occurs rapidly; typical school day event scripts among Kindergarteners are reported in the appropriate order, with appropriate content, and appropriate frequency after only one day of school (Fivush, 1984). As children obtain more experience in the school setting, their school-setting event scripts become richer (include more events) (Fivush, 1984, 2006; Hudson, Fivush, & Kuebli, 1992). Additionally, with increased experience, children's event scripts become more generic and include fewer details, suggesting that the most frequent events within a particular situation or context become central to the cognitive event script, while events that occur less frequently are not included in the script (Hudson & Nelson, 1986; Myles-Worsley, Cromer, & Dodd, 1986).

Research has also shown that the content of event scripts is similar for younger and older children. Although older children are better able to express event scripts verbally than younger children (due to their more advanced verbal abilities), there is no evidence that there is a significant difference in the ratings of the typicality of particular events in the scripts of preschool children and young school-age children (Adams & Worden, 1986; Farrar & Goodman, 1992; Hudson, Shapiro, & Sosa, 1995; Hudson & Nelson, 1986; McCartney & Nelson, 1981; Price & Goodman, 1990).

Once individuals develop event scripts, research has demonstrated that the scripts affect their behavior. For example, Anderson (1983) demonstrated that thinking about oneself engaging in a particular action increases behavioral intentions to perform that action. This study also provided evidence that the frequency of a behavior in a script is related to past frequency of performing the reported behavior, and is directly related to the likelihood that the behavior will occur in the future. Similarly, in children, context cues have been shown to activate scripts, which in turn affect behavior in play situations (Dalton et al., 2005).

The link between scripts and behavior has been evidenced in many domains, including: caregiving and parenting behaviors (Azar, Nix, & Makin-Byrd, 2005); decision making about sexual behaviors (Gilmore, DeLamater, & Wagstaff, 1996; Humphreys, 2013; Jones & Oliver, 2007; O'Sullivan & Byers, 1992), first date behavior (Serewicz & Gale, 2008), condom use and relationship status (Alvarez & Garcia-Marques, 2008), sexual aggression, victimization, and risky sexual behavior (Krahé, Bieneck, & Scheinberger-Olwig, 2007), and social drinking and smoking (Erblich, Montgomery, & Bovbjerg, 2009). In all of these domains, individuals' scripts regarding a topic were linked to their reported behaviors. Some studies also demonstrate that interventions targeting scripts lead to changes in behavior (Azar et al., 2005; Jones, Mace, Bray, MacRae, & Stockbridge, 2002; Smith, Holmes, Whitmore, Collins, & Devonport, 2001).

In contrast, there is only a small amount of research on the relationship between food scripts and eating behavior, and this research has been solely conducted with adults. For example, support for the link between food scripts and eating behavior is provided by the Food Choice Process Model (Bisogni, Jastran, & Blake, 2011; Sobal & Bisogni, 2009). This model suggests that food scripts provide key sequential information about food-related events, and that this information is used to simplify decision-making and guide behavior in food-related contexts. The link between scripts and behavior has been demonstrated for evening meals (Blake, Bisogni, Sobal, Jastran, & Devine, 2008) and family food choices (Blake & Bisogni, 2003). For example, food providers that act as Peacekeepers select foods to accommodate the needs of others in order to avoid conflict, while

Healthy Providers organize and monitor all intake and encourage healthy food consumption (Blake & Bisogni, 2003). The presence of food scripts for specific events, such as dates, has also been demonstrated in the literature (Amiraian & Sobal, 2009). Specifically, the consumption of some foods on a date is reported to be appropriate (based on messiness, odor pungency, whether the food is "romantic," etc.) while the consumption of other foods is considered inappropriate (Amiraian & Sobal, 2009).

The present study was designed to investigate whether children's scripts for various situations included food. The three events examined were going on a play date, viewing a movie at a movie theater, and attending a sports game. Each of these events had the potential to include food consumption, but food was not deemed central to the nature of the event (as it would be for a restaurant meal or Thanksgiving dinner). Based on prior research that has established that children today eat more frequently than children in the past (Popkin & Duffey, 2010), and are therefore more likely to include food as part of their event scripts (Abelson, 1981), we hypothesized that children would mention food at least once per event in their descriptions of the typical sequence of activities in these situations. Additionally, we hypothesized that the number of times food was mentioned across event contexts would be positively associated with children's body mass index percentile.

Method

Participants

Participants between the ages of 4 and 6 years ($M = 4.5$, $SD = 0.5$) were recruited from preschools and day cares in northwest Ohio. Parental consent and child assent were obtained. Forty-four children (45% girls) participated. The number of participants varied by event script (play date $n = 37$; movie theater $n = 38$; sporting event $n = 28$) because not all children reported knowledge of each type of event. Height and weight information was obtained by parent report for 52% ($n = 23$) of the sample and birthdates were obtained for 47% ($n = 21$) of the sample. Average body mass index of participants was 17.4 ($SD = 3.7$), and average body mass index percentile of all participants was 73.3% ($SD = 25.9$), which falls in the 5–85% healthy range of BMI percentile as suggested by the Centers for Disease Control (2014). The University Human Subjects Review Board approved all procedures prior to study initiation.

Procedure

Children were tested individually by two trained researchers at a quiet table in their classroom. The event script protocol was introduced with a sample event script about getting ready for school in the morning, in which one of the researchers described and showed pictures for the main activities that occur during this event. Then, for each of the three events (playdate, movie theater, sporting event), the child was asked to tell a story about four activities that occur during that event. These three events were chosen because they were considered to be events that children between ages 4 and 6 would have likely experienced or have sufficient knowledge of, and where food is available but consumption is not integral to the event. Other commonly experienced events were specifically not chosen because the availability of food at the event was considered highly variable (e.g., school), or because food consumption was considered to be integral to the nature of the event (e.g., a restaurant meal or certain holiday). A visual storyboard featuring a very simple line drawing illustrating the location of the event (child at the front door of a house, a movie theater, a sporting arena) followed by four empty boxes was used as a prompt for each event.

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