



Seeing is doing. The implicit effect of TV cooking shows on children's use of ingredients



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ABSTRACT

Prior research has established that TV viewing and food marketing influence children's eating behavior. However, the potential impact of popular TV cooking shows has received far less attention. TV cooking shows may equally affect children's food selection and consumption by distributing both food cues and portion-size cues. In an experimental study, elementary school children were randomly exposed to a cooking show, that either did or did not display a portion-size cue, or a non-food TV show. Results showed that children used significantly more sugar on their pancakes, and consumed significantly more of the pancakes after watching a TV cooking show compared to a non-food TV show. However, observing a portion-size cue in a TV cooking show only influenced sugar selection in older children (5th grade), but not in younger children (1st grade). The findings suggest that food cues in TV cooking shows stimulate consumption by inducing food cravings in children. Actual portion-size cues only appeared to affect older children's food selection.

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1. Introduction

TV cooking shows such as *Masterchef*, *Cake Boss*, or shows from celebrity TV chefs, such as Jamie Oliver, Gordon Ramsay or Nigella Lawson, are very popular nowadays (Collins, 2009; De Backer & Hudders, 2016; Pollan, 2009; Sitwell, 2016). However, the meals that are prepared in these shows contain too much sugar, fat, and/or salt according to World Health Organization guidelines (WHO) (Jones, Freeth, Hennessy-Priest, & Costa, 2013; Silva, Di Bonaventura, Byrnes, & Herbold, 2010). TV cooking shows have been shown to affect adult's eating behavior (Bodenlos & Wormuth, 2013; De Backer & Hudders, 2016). Bodenlos and Wormuth (2013), for example, randomly exposed their participants to either a cooking show or a nature show and found that adults consumed significantly more chocolates when they were exposed to a cooking show. Similarly, a cross-sectional study found a positive association between watching TV cooking shows and increased snack consumption in women (De Backer & Hudders, 2016).

Although children are not the primary target audience, TV cooking shows are broadcast in prime-time when most children are

watching TV (Kostyrka-Allchorne, Cooper, & Simpson, 2017). Increasingly, we also see children's versions of these cooking shows popping up, such as *Masterchef Junior*. Prior research has already demonstrated that food advertisements affect food choice and food intake in both children and adults (cf. Boyland et al., 2016; Folkvord, Anshütz, Boyland, Kelly, & Buijzen, 2016; Norman, Kelly, Boyland, & McMahon, 2016). Celebrity endorsers, popular cartoon characters and brand mascots have been shown to influence children's food choices and eating behavior (e.g. Boyland & Halford, 2013; Kraak & Story, 2015; Smits, Vandebosch, Boyland, & Neyens, 2015; Zeinstra, Kooijman, & Kremer, 2016). In addition, joint cooking of parents and children has been reported to increase children's vegetable consumption (van der Horst, Ferrage & Rytz, 2014). However, little attention has been paid to the impact of TV cooking shows on children's food selection and consumption. Therefore, the primary aim of the current study was to examine whether observing foods being prepared in a popular TV cooking show will affect how much food children choose and consume.

TV cooking shows display visual food cues and clearly communicate and zoom in on the palatable foods and food portions that are used. According to the literature, two types of theories explain how watching a TV cooking show may affect children's food selection and consumption. First, the visual food cues that are distributed by TV cooking shows may affect children's food consumption by triggering food cravings. There is increasing evidence

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that environmental cues such as the sight or scent of food play a crucial role in human eating behavior (cf. Boyland et al., 2016; McCrickerd & Forde, 2016; Spence, Okajima, Cheok, Petit & Michel, 2015; Wadhera & Capaldi-Phillips, 2014; Wansink, Hanks & Kaipainen, 2015). The visual salience of food has been shown to increase food consumption (McCrickerd & Forde, 2016; Wadhera & Capaldi-Phillips, 2014). According to cue reactivity theory, food cues, such as images of palatable foods, activate food cravings (Jansen, 1998). Previous studies have demonstrated that food cues attract attention, and prompt thoughts about food (Nijs, Muris, Euser, & Franken, 2010) and trigger physiological responses such as increased heart rate, salivation, blood pressure, skin conductance and gastric activity (cf. Alonso-Alonso et al., 2015; Castellanos et al., 2009; Folkvord et al., 2016; Nederkoorn, Smulders, & Jansen, 2000). Experimental research has shown that merely seeing images of palatable foods in food advertising increases food intake in both children and adults (Boyland et al., 2016; Harris, Brownell, & Bargh, 2009).

Second, the food portions that are shown in TV cooking shows may affect the amount of food that children select. These food portions can be viewed as descriptive norms on eating behavior which have been shown to influence people's dietary decisions and eating behavior (Cialdini, Reno, & Kallgren, 1990). A descriptive norm is a social norm that describes which behaviors are considered to be typical or normal (Cialdini et al., 1990; Cialdini, Kallgren, & Reno, 1991). Such descriptive norms differ from so-called injunctive norms (i.e., what we "know" is best) in that these norms are communicated by what we see others do, or what we believe they do (Cialdini et al., 1990). According to social modeling theory, the amount of food people eat is influenced by the amount we see other people eat (Herman, Roth, & Polivy, 2003; Pedersen, Gronhøj, & Thøgersen, 2015). In this paper, we will study whether media can also suggest such norms and influence children's consumption.

Messages or environmental cues that convey information on the eating behavior of other people have already been shown to affect food choice and intake (cf. Prinsen, de Ridder, & de Vet, 2013; Robinson et al., 2014; Stok, de Ridder, de Vet, & de Wit, 2014a; Stok et al., 2015; Stok, Verkooijen, de Ridder, de Wit, & de Vet, 2014b). Prinsen et al. (2013), for instance, exposed their participants to a bowl of individually wrapped chocolates, and manipulated the presence or absence of empty chocolate wrappers between the conditions. The findings showed that participants were 3 times more likely to take chocolates when the empty wrappers were present. In the same vein, *standard* portion-sizes and portion-size suggestions have been shown to affect eating behavior by influencing people's perceptions of what portion-sizes are normal (e.g. Burger, Fisher, & Johnson, 2011; Fisher, Rolls, & Birch, 2003; Neyens, Aerts, & Smits, 2015; Robinson et al., 2014; Rolls, Roe, Kral, Meengs, & Wall, 2004; Wansink & Kim, 2005; Wansink, Painter & North, 2005). Prior studies revealed that children eat more when they are offered larger portions (Fisher, Liu, Birch, & Rolls, 2007; Fisher et al., 2003; Marchiori, Waroquier, & Klein, 2012), and when larger serving-sizes are suggested on food packaging (Neyens et al., 2015).

Based on descriptive norm theory (Cialdini, 2009) and prior research on the impact of descriptive norms on food intake, we expect that TV cooking shows will affect children's use of ingredients. More specifically, it was hypothesized (Hypothesis 1) that observing descriptive portion-size norms in a cooking show will affect how much of a specific food ingredient children will select. Furthermore, food cue reactivity theory states that merely seeing palatable foods can prime food cravings. Prior studies have indeed established that children eat more after seeing images of palatable foods in food advertising (Harris, Bargh, & Brownell,

2009; Harris, Brownell et al., 2009). Hence, it was hypothesized (Hypothesis 2) that children would eat significantly more after exposure to a cooking show compared to exposure to a non-food TV show. In addition, it was hypothesized (Hypothesis 3) that children's BMI would moderate the impact of watching a TV cooking show on children's food intake. It is well-documented that people with a higher BMI are more susceptible to food cues (Birch, 1999; Halford et al., 2008; Kaur, Choi, Mayo & Harris, 2003). Finally, we wondered whether the impact of observing descriptive portion-size norms depends on age (RQ1). Previous research has shown that social norm susceptibility increases with age as children move to adolescence (Chan, Prendergast, Gronhøj, & Bech-Larsen, 2010). When children get older, they tend to rely more on social peer norms and tend to compare their behavior more to others (Arnett, 1995; Lally, Bartle, & Wardle, 2011; Stok et al., 2014a). Therefore, older children and teenagers might be more vulnerable to descriptive portion-size norms communicated through TV cooking shows than younger children.

2. Methods

2.1. Participants

A sample of 111 Flemish children from the first and fifth grade (typical age groups of 6–7 versus 10–11 year olds, respectively) of elementary school were recruited from four Flemish elementary schools during March and April 2016 (52% female, $M_{\text{age}} = 8.8$, $SD = 2.1$). Ethical approval for the study was obtained from the authors' university ethical committee, and the parents provided their informed consent.

2.2. Stimuli and procedure

The hypotheses were addressed using a one-way between-participants experiment. We manipulated the type of TV show that the children saw. This was either a cooking show or a non-food TV show. Further, we manipulated whether the cooking show displayed a sugar portion-size norm or not. This resulted in a 2 (first vs fifth grade) by 3 (cooking show with and without depiction of sugar portion-size norm, non-food TV show) between-participants experiment. The children were randomly assigned to one of the three conditions.

The educational cooking show *'Dagelijkse Kost'* (*Daily Meal*) was selected as the main experimental stimulus. This popular show airs every weekday at 6:15 p.m. at the national public channel, which is around dinner time. An episode lasts about 15 min and is not interrupted by any advertising (De Backer & Hudders, 2016). The show has been very popular ever since it aired in September 2010 and attracts about 1 287 088 viewers per episode on average (CIM, 2015; De Backer & Hudders, 2016). The show is hosted by Jeroen Meus, a young, amiable cook who is well-known among the Flemish. For this experiment, we selected an episode in which the chef prepares pancakes and spreads them with a copious amount of brown sugar, a traditional Flemish dish.¹ This episode lasts 3 min and 36 s. Two versions of this episode were created: one version that shows how much sugar the chef sprinkles on his pancakes, and an edited version without the display of the sugar portion-size norm. In this edited version, the final scene in which the chef eats the pancake roll is kept so that viewers get the impression that the pancake is eaten without any garniture. In the control condition, the children were shown an episode of *Greenland* that was similar in length. This program is about nature and gardening and is

¹ In Flanders, brown sugar is a popular and common pancake topping.

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