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Research report

Social modeling effects on snack intake among young men. The role of hunger

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ABSTRACT

This study examined whether young men adjusted their snack-food intake to that of a same-sex eating companion. Additionally, hunger was assessed as a possible moderating variable. A total of 59 young men (*M* age = 21.73) participated. An interaction between participants' hunger and confederate's intake on the total amount of snack food (in grams) consumed was found. Only those males who were hungry at the start of the experiment modeled the intake of their eating companion. This finding suggests that hunger may play an important role in explaining the magnitude of social modeling among young men.

The association between environmental factors and human eating behavior has been studied extensively (see, e.g., Brug, 2008; Stroebele & de Castro, 2004; Van der Horst et al., 2007). These studies have consistently shown that food intake and food choice are affected by where, when and with whom one eats. Moreover, eating with or in the presence of other people might result in a different consumption pattern than solitary eating. Social facilitation studies have demonstrated that people eat more in the presence of others than when alone. It has been found repeatedly that as the number of people present increases, the amount of food consumed increases (e.g., de Castro & Brewer, 1992; Patel & Schlundt, 2001). Evidence for a direct effect of one's eating companion's intake on one's own intake can be found in the social modeling literature. These studies all find the same pattern: people tend to eat more when their eating companion eats more and less when their eating companion eats less (see Herman, Roth, & Polivy, 2003 for a review). One mechanism proposed to explain this effect is that in the absence of clear intake guidelines, people often engage in social comparison (Leone, Pliner, & Herman, 2007). More specifically, the amount eaten by the other might serve as a guide for appropriate intake. Most people are worried about being seen as eating excessively, because excessive eating is associated with negative connotations such as being deficient in self-control or the ability to delay gratification (Puhl, Schwartz, & Brownell, 2005); so the eating behavior of others might serve as an indication of how much is the appropriate (non-excessive) amount to eat. If the eating companion eats a large amount, one can safely eat a large amount too. However, if the eating companion eats only a small amount, then one must eat a small amount as well if one is to avoid eating excessively by comparison.

Until now, the vast majority of studies on social modeling among same-sex eating partners has focused almost exclusively on females (e.g., De Luca & Spigelman, 1979; Goldman, Herman, & Polivy, 1991; Hermans, Larsen, Herman, & Engels, 2008; Polivy, Herman, Younger, & Erskine, 1979; Rosenthal & Marx, 1979; Roth, Herman, Polivy, & Pliner, 2001). A few studies have been conducted on social modeling and food intake in men, and their results are mixed. One study that explicitly targeted males was the first study on modeling effects on eating behavior. Nisbett and Storms (1974) found that male participants consumed more food (i.e., crackers) in the presence of a male confederate who ate several (20) crackers and consumed less when in the presence of a confederate who ate only one cracker. These results were replicated in a study that compared modeling of food intake between male and female participants (Conger, Conger, Costanzo, Wright, & Matter, 1980), where it was found that participants' cracker intake increased with increases in the eating companion's intake for both males and females. In a more recent study, however, no similarities in food intake were found in dyads consisting of two male friends or two male strangers, indicating that men did not match each other's intake (Salvy, Jarrin, Paluch, Irfan, & Pliner, 2007).

We propose that sex differences in modeling of food intake might be explained by the notion that women and men possess divergent motivations when it comes to eating in social situations.

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If people adjust their intake to that of others to remove uncertainty about appropriate intake or to avoid negative judgments, then women are perhaps more likely to display social modeling of food intake. Eating, body image, weight and physical appearance are acknowledged as particularly salient concerns among women (Rodin, Silberstein, & Striegel-Moore, 1984) and therefore women may be more inclined to adjust their intake to that of their eating companion in order to avoid creating a negative impression. If these assumptions are correct, then the question arises to what extent men's intake is affected by their eating companion's intake. In this study, we focus exclusively on males in order to determine whether the modeling effect is restricted to females (cf. Hermans, Engels, Larsen, & Herman, 2009). Because social modeling effects of food intake among men have been examined mostly in laboratory taste-test designs (e.g., Conger et al., 1980; Nisbett and Storms, 1974), and therefore are not comparable with real-world eating situations, we unobtrusively observed male participants in a semi-naturalistic setting (i.e., a simulated living room) in order to maximize ecological validity.

Since eating behavior is multiply determined, it is important to take other important factors into account that may affect eating (and subsequently social modeling). An important and obvious factor might be an individual's level of hunger. Hunger is defined as a strong desire or need for food (Smith & Ferguson, 2008). Hunger is obviously associated with food intake and promotes food-seeking and ingestive behaviors (e.g., Castonguay, Applegate, Upton, & Stern, 1983; Nicolaidis & Even, 1985). There is not much research on the possible moderating role of hunger on social modeling of food intake. Goldman et al. (1991) were the first to manipulate hunger in a social-modeling experiment, pairing 12 or 24 h food-deprived individuals with a confederate instructed to eat either a lot or a little. The modeling effect was pronounced irrespective of (female) participants' feelings of hunger. So, regardless of what their body was telling them, the women's default response was to model their eating partner's food intake. This finding might be explained by the notion that women, more than men, are aware of their eating partner's intake and use this amount in order to determine their own intake (by matching their intake to that of the other person). For men, however, it might be that social modeling will play a role only if they are intrinsically motivated to eat. Their hunger level will make them more aware of the other's intake, which might lead consequently to a more prominent role of modeling of food intake. To our knowledge, this is the first study that examines whether hunger would promote social modeling among males.

In the present study, an experimental–observational design was used in which male participants spent a 15 min break, between two cover tasks, with a male confederate instructed to eat nothing, or a small amount, or a large amount of snack food. The main aim of this study was to examine whether young men adjusted their snack intake to that of another young man (previously unknown to them). Moreover, since not much is known about the role of males' hunger levels in the magnitude of modeling effects, we also examined the moderating effect of (measured, not manipulated) hunger levels on young men's social modeling of snack intake.

Method

Design

We employed a between-participants design with 3 experimental conditions in which male participants were exposed to male confederates who were instructed to eat nothing (no-intake confederate condition), 2 handfuls of cocktail nuts (low-intake confederate condition) or 10 handfuls of cocktail nuts (high-intake confederate condition).

Participants

A total of 61 young men (mainly undergraduate students) volunteered for the study. Participants were recruited via the sign-up system of the Behavioural Science Institute of the Radboud University Nijmegen or through direct approach by the experimenters in public places around the campus. Participants were awarded course credit (for educational requirements) or a €10 gift cheque for completing the study. Two participants were excluded from further analyses because they reported an allergy to peanuts and therefore could not eat the available test food. The final sample, then, consisted of 59 participants with a mean age of 21.73 (SD = 3.73) and a mean BMI of 23.13 (SD = 2.68). Table 1 displays the participants' characteristics across conditions.

Confederates

Four male students at the Radboud University Nijmegen acted as confederates. They had a mean age of 23.90 (SD = 2.91) and a mean BMI of 22.51 (SD = 1.58). Before the start of each session, we instructed the confederates regarding the amount of snack food that they had to consume (i.e., nothing, 2 handfuls, or 10 handfuls of cocktail nuts) during the break. The confederates were carefully instructed and trained in the procedure of picking the handfuls of nuts. They were randomly assigned to one of the three confederate-intake conditions. Further, the confederates were instructed not to take the initiative in the social interaction but to react naturally to remarks and questions from the participant (cf. Van Straaten, Engels, Finkenauer, & Holland, 2009).

Procedure

Under the pretext of a study on the evaluation of movie trailers, participants were asked to watch and evaluate three movie trailers. This was a cover story to prevent participants from becoming aware of the actual aim of the study (i.e., social modeling of food intake). The true nature of the study was discussed after the data collection of the whole study had been completed.

With the rationale of making the situation as naturalistic as possible, we furnished a small room as an ordinary living room (cf. Hermans et al., 2009). Participants were invited between 10 a.m. and 6 p.m., during the months of September–December 2008. Each session took approximately 60 min in total.

The experimenter met both the participant and the confederate at the front office of the lab facilities. After providing consent, both

Table 1
Participants' characteristics providing mean ± SE and range in parentheses.

	Total (N = 59)	No-intake condition (N = 18)	Low-intake condition (N = 20)	High-intake condition (N = 21)
Age (years)	21.73 ± 0.49 (15–35)	22.56 ± 0.86 (19–35)	21.00 ± 0.70 (18–32)	21.71 ± 0.94 (15–31)
BMI	23.13 ± 0.35 (18.41–31.25)	23.32 ± 0.73 (20.23–31.25)	23.58 ± 0.71 (19.04–30.86)	22.54 ± 0.35 (18.41–25.96)
Overweight (%)	15.3	16.8	25.0	4.8
Obese (%)	3.4	5.6	5.0	0
Hunger level	4.12 ± 0.31 (1–8)	4.06 ± 0.58 (1–7)	4.15 ± 0.54 (1–8)	4.14 ± 0.53 (1–8)