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# Social norms and their influence on eating behaviours

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## Abstract

Social norms are implicit codes of conduct that provide a guide to appropriate action. There is ample evidence that social norms about eating have a powerful effect on both food choice and amounts consumed. This review explores the reasons why people follow social eating norms and the factors that moderate norm following. It is proposed that eating norms are followed because they provide information about safe foods and facilitate food sharing. Norms are a powerful influence on behaviour because following (or not following) norms is associated with social judgements. Norm following is more likely when there is uncertainty about what constitutes correct behaviour and when there is greater shared identity with the norm referent group. Social norms may affect food choice and intake by altering self-perceptions and/or by altering the sensory/hedonic evaluation of foods. The same neural systems that mediate the rewarding effects of food itself are likely to reinforce the following of eating norms.

**Highlights:**

- Social norms about eating have a powerful effect on both food choice and intake
- Norm following is an adaptive behaviour
- Norms provide information about safe foods and facilitate food sharing.
- Social judgements associated with following foods norms give them power

Eating often occurs in a social context and the food choices of others and the amounts that those around us eat have a powerful effect on our own consumption decisions. We model the eating choices of our dining partners and consume amounts similar to what they eat (Herman et al. 2003). Sometimes the presence of other diners may augment consumption compared with eating alone (de Castro and Brewer 1992) and other times eating may be inhibited, even in the face of deprivation-induced hunger (Goldman et al. 1991).

One mechanism that may underlie the effects of social context on eating is the operation of social norms. Social norms are implicit codes of conduct that provide a guide to appropriate action. There is evidence that we use information about the eating behaviour of others as a guide as to what is appropriate behaviour in a given context (Herman et al. 2003). Dietary behaviours have also been reported to be related to perceptions of normative behaviour within peer groups (Ball et al. 2010; Lally et al. 2011; Louis et al. 2012; ) and food intake can be predicted by the eating behaviour of socially connected peers (Feunekes et al., 1998; de la Haye, Robins, Mohr, & Wilson, 2010; Pachucki, Jacques, & Christakis, 2011).

Studies on the effects on food intake/choice of providing normative information about the eating habits of others have been reviewed elsewhere recently (Robinson et al. 2013; 2014). Studies on social facilitation of eating, modelling and impression management are reviewed elsewhere in this special issue. The aim of this paper is to add to this literature by exploring why people follow eating norms and how these norms influence eating. Consideration will also be given to the factors that determine when people follow norms and when other factors override the influence of norms.

## What are social eating norms and where do they come from?

Social eating norms are perceived standards for what constitutes appropriate consumption, whether that be amounts of foods or specific food choices, for members of a social group. The social group might be defined at the level of nationality, peer group, family or friendship grouping. Social norms

may be communicated directly via cultural practices and rules, actual behaviour in a given situation, or indirectly via environmental cues such as portion size norms. For example, a social norm might be avoidance of eating insects, which is communicated by the group cuisine rules and reinforced by observation of disgust responses to (the prospect of) eating insects (Looy et al. 2013). Descriptive norms refer to the perceptions of the prevalence or extent of a behaviour (what other people do) and injunctive norms refer to perceptions about what behaviour is expected (what other people endorse) (Cialdini et al. 1990).

**Why do people follow social eating norms?**

Two possible reasons why people follow eating norms are that 1) following a norm enhances affiliation with a social group and being liked; and 2) following a norm results in eating that is correct (Deutsch and Gerard, 1955). Many studies have been conducted to investigate the role of these motives in norm following in the context of eating.

It has been reported that traits linked to the need for affiliation, such as self-esteem and empathy, are associated with norm following (Robinson et al. 2011). Robinson and colleagues found that participants were more likely to follow the eating norm set by their eating partner when they scored high on a measure of empathy and low on a measure of self-esteem. They concluded that social acceptance concerns play a role in modelling of a food intake norm. Hermans and colleagues found that the quality of a social interaction affects the degree of modelling observed (Hermans et al. 2009). They instructed a confederate to act either in a friendly or unsociable manner and reported that less modelling occurred when the confederate acted in a friendly manner than when the confederate acted in an unsociable manner. One interpretation of the results of this study is that under conditions where there is little need to ingratiate oneself, because a social partner is already accepting, it is less likely that a social norm inferred from his or her behaviour will be followed. This hypothesis was tested explicitly in a study that employed an experimental manipulation to alter feelings of social acceptance before a social eating opportunity. Priming feelings of social acceptance reduced the extent to which the participant modeled the food intake of a confederate (Robinson et al. 2011). The results of these

studies are consistent with the idea that norms are followed as a means of affiliating with others and gaining acceptance.

Several studies have examined how people adjust their eating behaviour to manage their public image and create a certain impression on others. In reviewing this literature, Vartanian, Herman and Polivy concluded that we make use of stereotypes about consumption patterns to convey an image of ourselves in accord with that stereotype (Vartanian et al. 2007). Eating a small portion conveys a feminine and otherwise positive image, which may be used to create a favourable impression on a fellow diner who values those characteristics (Pliner and Chaiken, 1990). These data are in line with evidence from the broader social psychology literature that adopting normative behaviour achieves a goal of affiliating with others that is driven by our strong desire to be liked (Baumeister & Leary, 1995).

Other studies have examined whether people follow norms conveyed by messages about how other people have behaved in a specific situation, rather than norms set by another present person's eating (see Robinson et al. 2014 for a review). These types of norms are usually referred to as informational norms (Deutsch and Gerard, 1955). In the remote confederate design, participants are exposed to fictitious accounts of the amount of food consumed by previous participants in that study (Feeney et al., 2011; Pliner & Mann, 2004; Roth, Herman, Polivy, & Pliner, 2001). If remote confederates eat a lot, this signals a high intake norm, whereas if they eat only a little then this signals a low intake norm. A high norm increases food intake relative to a no norm control condition whereas a low intake norm decreases intake relative to a no norm control condition (Feeney et al., 2011; Pliner & Mann, 2004; Robinson et al. 2011; Roth et al., 2001). Amounts consumed by previous participants in a study can also be communicated via cues such as empty food wrappers. There is evidence that participant choices are affected by such cues. People are more likely to choose a "healthy" versus "unhealthy" food item if they see evidence that previous participants have chosen "healthily" (Prinsen et al. 2012). Furthermore, text-based descriptive norm messages conveying information about the eating behaviour

of others affect subsequent food choices (Robinson et al. 2014; Stok et al. 2012; 2014). In these instances, following the norm does not serve to promote affiliation or a sense of belonging because there is no other person present. Hence, it might be concluded that the motive to behave correctly explains why people follow eating norms. Taking the example of studies using a remote confederate, the intake of the fictitious participants indicates the "right" way to behave in terms of how much to eat or what foods to choose, and so that norm is adopted (Cialdini and Trost 1998; Deutsch and Gerard, 1955).

Clearly, there is evidence that on occasion people might follow an eating norm to satisfy a desire to be liked but there is also evidence that in the absence of direct social interaction, people still follow eating norms, perhaps because they desire to behave correctly. Traditionally these motives have been conceptualised as being independent (Cialdini and Goldstein, 2004). However, a more detailed consideration of the evidence suggests that affiliation and correctness concerns are not so easy to disentangle as it might at first seem. Although the use of the remote confederate design may minimise the extent to which people alter their behaviour to create a good impression, there remains the possibility that the participants may follow the norm to impress the experimenter, assuming that they are aware that their food intake/choices are being monitored by the experimenter. In addition, adhering to the norm may make the individual feel as if s/he is a more socially-responsive individual and therefore perhaps more likely to be accepted by others. Given that affiliation and correctness motives seem difficult to dissociate, it may be that rather than considering them as separate and independent, we should consider the possibility that they are interdependent.

**Norm following as an adaptive behaviour**

A new model of social eating norms is suggested here that emphasises the interdependence of both affiliation and informational motives in explaining the power of social norms. The suggestion is that norm following is most usefully conceptualised as an adaptive behaviour that makes it more likely that we will consume safe foods and might promote food sharing. According to this explanation,

behaving correctly by following the group norm enhances evolutionary fitness. It is further proposed that the force of norms, the reason why they have such a powerful influence on us, lies in the emotional consequences of either following them (social approval) or not following them (social disapproval). More specifically, it is proposed that the adaptive function of social influence is supported by co-opting affiliation motives: I follow your lead on how to behave and this is reinforced by feelings of a sense of group belonging or the avoidance of social disapproval. Conceptualised in this way, affiliation concerns underpin the force of adaptive social eating norms. The model rests on three specific arguments that will be examined in turn.

*Norm following is adaptive in ensuring the selection of safe foods*

The selection of safe and nutritious foods is critical for survival but presents a challenge to humans who are omnivores born with few innate flavour preferences (Rozin, 1976). We have to acquire knowledge about which foods are edible and non-toxic and one way that we learn about the foods that are good to eat is by associating food flavours with consequences and adjusting our behaviour accordingly: we learn to like foods that provide energy and avoid items that make us sick (see Brunstrom, 2007 for a review). However, we are also able to take advantage of the learning of others by following their lead. Following a social norm shortcuts the need for learning on a trial-and-error individual basis and so reduces the costs associated with this learning, such as the time taken to learn and the likelihood of error (Boyd et al. 2011). This may be especially important when it comes to learning about foodstuffs because of the potentially lethal consequences of consuming the wrong substances. In support of this notion is the fact that young children are more likely to try a novel food if they see a familiar adult eating the same food (Addessi et al. 2005) and will avoid drinks that are paired with an expression of dislike on the face of someone else (Baeyens et al. 1996). Indeed, there are numerous examples of young children using social information to guide their eating (for a review see Shutts et al. 2012). Such social learning accumulates across generations in the forms of cultural practices around food (Rozin, 1996). Hence, following social eating norms increases evolutionary fitness because eating what others eat is a good guide to food safety and nutrition.

*Norm following is adaptive in promoting cooperation and food sharing*

Another reason why we tend to eat what others eat might be that it is a behaviour that evolved to support cooperation between members of a group. Indeed, it has been argued that the human disposition to cooperate developed in the context of cooperation around foraging for food (Tomasello, 2008). Evidence for this tendency to cooperate can be seen in experimental game playing studies in which people demonstrate a sense of fairness in dividing resources relatively equally between anonymous game playing partners, even when there is no chance for punishing unfair distribution (Dawes and Thaler, 1988). In the context of food foraging, hunter-gatherer societies engage in cooperative food gathering and sharing to the extent that some food resources are shared among a group regardless of who actually made the kill (Hill, 2002). Such cooperative behaviour would be supported by a social norm that one should not eat more than other members of a group, as has been reported on in experimental studies of social eating (Herman et al. 2003). Therefore, norm following may have had an additional evolutionary benefit in promoting food sharing and cooperative behaviour.

*Social norms have force because they are associated with social judgement*

The end point of eating what others do could be achieved by directly copying what they do or by observing the behaviour of others and then changing one's own behaviour on the basis of those observations (observational learning). In fact there is evidence that this kind of copying occurs around food. For example, studies of eating and drinking in humans show that consumption behaviour may be imitated directly by a person taking a sip or reaching for food directly after an observed person performs the same behaviour (Hermans et al., 2012 Larsen et al., 2010; Koordeman et al., 2011). This behaviour may be underpinned by basic neural processes that link perception with action, the so called "mirror neuron system" (Rizzolatti and Craighero, 2004). Similarly, rats and chimpanzees display a tendency to copy the behaviour of conspecifics and this tendency increases with the number of animals demonstrating the behaviour (Chou and Richerson, 1992; Haun et al., 2012). Monkeys will copy of the food choices of another monkey when they migrate into a new environment, even if that choice goes against their own learned preferences (van de Waal et al. 2013). However, conformity via imitation or observational learning is not the same as adopting a group nom.

A critical difference is that there are emotional consequences when we follow (or do not follow) a social norm. We derive a sense of belonging by adopting the norms of a group and this may provide us with a sense of self-worth and esteem that might be considered rewarding (Deutsch and Gerard, 1955). But we also know that there are social sanctions or punishments that arise from not following a norm (Baumeister & Leary, 1995; Fehr and Fischbacher, 2004). A consequence of not following a social eating norm might be embarrassment or the disapproval of others. Indeed, given that stereotypes associated with overeating are generally negative and overeating and obesity are stigmatized (Vartanian et al. 2007), it may be that following an intake norm is primarily motivated by a desire to avoid social sanctions associated with appearing to eat excessively (Herman et al. 2003). Regardless, while following an eating norm might be underpinned by processes such as imitation, mere imitation does not constitute socially normative behaviour in and of itself. Norms have force because deviations are discouraged by social judgement (approval or disapproval) and the emotions that accompany such judgements (Tomasello, 2008).

The value of the proposed model lies in providing a single framework for understanding the role of affiliation and informational motives in norm following behaviour and highlighting the evolutionary benefit of norm following and the power of norms. Further evidence in support of the model may be gathered from a consideration of the factors that affect whether a norm will be followed (or not), which will be considered next.

## What factors affect whether an eating social norm is followed?

Several factors have been identified that moderate norm following in the context of eating. However, relatively few studies have been conducted and so it is possible that important moderators have yet to be identified.

### *Norm uncertainty*

An evolutionary approach to understanding the following of social eating norms suggests that norms will be more likely to be followed when there is uncertainty about the consequences of food choice

(Laland, 2004). If individuals' personal experience means that they are not sure of how to behave then they should be more likely to follow the lead of others, because that will be the safest choice. In support of this idea, modelling of food intake is less likely in eating situations where there are already clear expectations about how much one should eat, for example at habitual eating occasions such as breakfast, versus snack sessions where intake norms are more uncertain and variable (Hermans et al. 2010). It should be more adaptive to follow a norm when there is a clear consensus about that norm (Morgan et al. 2012). In support of this suggestion, it has been reported that when communicated intake norms are ambiguous participants are less likely to follow them (Leone et al. 2007). In general these data are in line with the results from studies of other types of social influence, such as conformity to the perceptual judgements of others (Asch, 1955). In a classic series of experiments, Asch asked participants to make a judgement about the length of a series of lines. In the Asch paradigm participants are shown one line on card which serves as the standard line and then three lines on another piece of card. The task is to match one of the three lines to the standard. The participant is unaware that the other "participants" in the study are actually confederates of the experimenter and have been instructed to give a specific answer that is sometimes correct, but sometimes incorrect. Asch reported that the majority of participants were not swayed in their judgements even when the confederates were unanimous in reporting incorrect responses about the line. 38% of participants could be persuaded to to give the wrong answer to the question when the confederates were all providing the wrong answer but there was even less conformity to the group when the participants had an ally who was consistent in providing the correct answer (Asch, 1955). Hence, social influence on both eating and perceptual judgements is affected by certainty about the norm.

Asch also found that conformity was less likely when there was a bigger discrepancy between the standard line and the comparator lines, presumably because participants were more confident of the "correct" answer when the discrepancy was large (Asch 1955). There have been few studies of modelling of eating in groups but it would be interesting to examine how food choices are affected by group norms and the extent to which these effects depend upon the certainty with which personal

choices are made. We have reported that modelling of food choices in a buffet line was rather limited insofar as the presence of one "unhealthy" or "healthy" eating confederate did not affect total calories selected at the lunch (perhaps because the participants had a clear sense of what constitutes an appropriate lunch), but the presence of the "unhealthy" confederate did liberate the participants to choose few low energy dense buffet items (Robinson and Higgs 2012). These data suggests a modest influence of the presence of a healthy eating dining companion on food choices in a context where there is free choice for a range of palatable food items, but it remains to be investigated whether greater modelling would be observed in the presence of a group of "healthy eaters".

*Norm referent group*

Some evidence suggests that choice norms are more likely to be followed if the referent group belongs to a socially proximal group or "in-group" with whom an individual perceives shared identity (See review by Cruwys, Bevelander, and Hermans in this issue.). For example, Cruyws and colleagues (2012) reported that a perceived eating norm affected behaviour when it came from a socially proximal group (fellow university students), but not when it came from a less proximal group (students from a rival university). A norm may be rejected if it comes from a social group with which a person does not wish to associate. For example, it has been reported that people are motivated to avoid the behaviour patterns of "out-groups" that are disliked, seen as lower status, or dissimilar, so as to distance themselves from that group (Berger & Rand, 2008; Berger and Heath, 2008). On the other hand, people tend to follow the norms of "out-groups" that are seen as aspirational (Englis and Solomon 1995). The degree to which participants identify with a norm group also moderates the influence of an eating norm: participants who identify more strongly with the norm group are more likely to follow the norm (Stok et al. 2014). Hermans et al. (2008) found that matching of food intake was less likely when a normal weight participant ate with an underweight confederate, possibly because the participants did not regard the underweight confederate as an appropriate model, or did not identify with the model. A similar effect has been reported by McFerran and colleagues whereby participants were less influenced by the choices of a confederate at a buffet when the confederate was overweight and the participant was normal weight than when both the confederate and participant

were normal weight (McFerran et al. 2010). These data are consistent with the idea that norms provide a shortcut for learning about appropriate food choices, because in-group members would be expected to provide the most reliable information about the consequences of eating in the group environment.

People with whom we have an intimate relationship (e.g. friendship or family relationship) might be expected to provide the most reliable norms because we are likely to share the same environment. However, there is evidence of similar modeling of food intake among both friends and strangers (Howland, Hunger, & Mann, 2012; Salvy et al. 2007; Kaisari and Higgs, this issue). Moreover, there are reports that modeling effects on intake are greater when the eating partners do not know each other than when they are siblings (Salvy, Vartanian, Coelho, Jarrin, & Pliner, 2008). It may be that these results are dependent upon the type of "friendship" and factors relating to shared identity and/or the need to affiliate. For example, I may perceive a shared identity with people whom I have never met before because we are similar in some way (e.g. same gender, age, social group). I may follow the lead of these "strangers" because I consider them "in-group" members. I may also follow the lead of strangers because I have a desire for social approval, especially if I perceive them to belong to a desirable "out-group". This suggests that studies on how intimate relationships affect social influence should focus on manipulating specific underlying processes such as shared identity to tease out some of these potential influences.

*Individual characteristics*

There has been no systematic investigation of the effect of gender on social eating influences. In fact, most studies have recruited only women. Two studies failed to find modeling effects on eating in men (Salvy et al. 2007; Hermans, Herman, Larsen, and Engels 2010), although the reasons why this might be the case are unclear. Men may have a greater drive for distinctiveness than women do, which may lead to nonconformity in eating (Cross & Madson, 1997). On the other hand, it might be that women may possess a greater interest in facilitating positive social bonds than do men, perhaps due to higher

empathic tendencies (Eagly & Carli 1981). Evidence from studies of other types of social influence are consistent with the suggestion that women are more likely to follow social norms than are men (Eagly and Carli, 1981; Bond and Smith, 1996), but further investigation of gender differences in responses to eating norms and the underlying mechanisms is required before strong conclusions can be drawn.

*Food type*

Palatability considerations may override normative considerations. Pliner and Mann (2004) found that social norms did not influence participants to choose an unpalatable "healthy" cookie over a palatable "unhealthy" cookie. This may be in part because some people find it difficult to resist tempting foods and will go for the more palatable "unhealthy" cookie even if it is not the choice that other people are seen to make. It may be that social information cannot persuade people to consume foods that they dislike (or perhaps know to be potentially unsafe). However, evidence from Salmon and colleagues (2014) suggests that a social norm message may persuade people to consume more of a "healthy" food but only if the participants are lacking in self-control. In this study the "healthy" items were cereal bars and fruit and nuts rather than unpalatable foods. More data are required on the issue of how food type interacts with norm information to affect food intake and choice, especially for healthy foods such as vegetables that people typically regard as unpalatable.

## How do social norms affect eating behaviour?

An important question that has yet to be addressed in any detail is how social norms affect eating. Answering this question will have implications for the potential use of social norms in interventions aimed at changing dietary behaviour. A person may decide to choose a "healthy" food option because others do so, but if this behaviour is based purely on public acceptance of the norm (in other words, the choice is made only so that that person wishes to be seen to conform), then this type of conformity is unlikely to form the basis of an effective, long term intervention on behaviour change. On the other

hand, if norms are changing underlying perceptions of oneself or of the food then this would suggest a private acceptance of the norm rather than mere public conformity, which might be more like to sustain behaviour change in the long run.

*Change in self-perception*

It has been suggested that conforming to group norms may occur because it results in a positive change in self-perception and attitudes. If an observed norm is a "healthy" food choice and I identify with the norm referent group then I might see myself as the kind of person who makes "healthy" food choices and behave in a manner consistent with this self-identity (Bem, 1972). I might also feel that if other people like me are performing the behaviour then this means that I am capable of doing it, which could increase my feelings of self-efficacy for performing the behaviour (de Cremer and van Vugt, 1998). In the case of following healthy eating norms, Stok and colleagues (2014) have reported that the effect an eating norm about vegetable consumption increased self-reported vegetable consumption and that this effect was partially but not fully mediated by changes in self-identification and self-efficacy leaving some variance unaccounted for.

*Change in sensory/hedonic evaluation of foods*

Another possible mechanism underlying how social norms affect eating is that they change the perception and evaluation of the foods. Asch suggested that participants may have conformed with the incorrect answer of the confederate because they experienced a perpetual distortion and perceived the incorrect stimuli as correct (1955). In support of this hypothesis, Berns and colleagues (2005) reported that conformity to the incorrect group in an Asch-like perceptual judgement task was associated with increased activity in areas of the brain associated with early visual processing. Others have reported that changes in brain reward networks are associated with adherence to social norms (for a review see Izuma, 2013). For example, the provision of social information, in the form of reviews about a song, increased activity in brain areas associated with reward when the songs were heard (Campbell-Meiklejohn et al., 2010).

In the case of eating, one could hypothesise that the behaviour of others might affect sensory/hedonic responses to food cues and food consumption, thus affecting food-related decisions. This might be achieved by modulation of expectations about the consequences of consuming that food. A food might be expected to have positive rewarding consequences and taste good because other people whom we identify with are eating it and enjoying it. Moreover, it could be that social influence is accompanied by neural changes that align the liking of the food with others' liking of the food, as has been shown for the effect of other external cues such as labels (Grabenhorst et al. 2009). In support of this idea, we have found that providing information about how much an in-group but not an out-group likes orange juice affects participants' expected liking for orange juice (Robinson and Higgs 2013). In addition, it has been shown that being in agreement with the preferences and decisions of others activates brain reward networks whereas being in disagreement has the opposite effect (Klucharev et al.2009; Botvinick et al. 2004). Thus, conformity to eating norms could be driven by increases in reward-related brain activity as behaviour comes in line with the group. Cleary, this hypothesis requires careful testing but it is consistent with the idea more generally that reward is at the core of social conformity (Zaki et al. 2011).

**Conclusions**

Normative social influence on eating is potent and pervasive. The presence of other people at an eating occasion or when choices are made about food has a powerful effect on behaviour. This may be because humans are have a highly developed capacity to learn from the behaviour of others and find the approval of others rewarding and disapproval aversive. It is proposed that eating norms are followed because they provide information about safe foods and facilitate food sharing. They are a powerful influence on behaviour because following (or not following) norms is associated with social judgements. Norm following is more likely when there is uncertainty about what constitutes correct behaviour and when there is greater shared identify the norm referent group. Social norms may affect food choice and intake by altering self-perceptions and the sensory/hedonic evaluation of foods. The same neural systems that mediate the rewarding effects of food itself are likely to reinforce the following of eating norms.

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