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The social facilitation of eating. A review

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ABSTRACT

The social facilitation of eating (i.e., people eating more in groups than when alone) has been studied for about three decades now. In this paper, we review the empirical research (diary studies, observational studies, and experimental studies) of social facilitation, attending to factors that increase or decrease socially facilitated eating. We also review the various explanations (e.g., "time extension") that have been offered for the effect and offer our own speculations as to the underlying mechanisms. Further, we discuss promising directions for future research on the social facilitation of eating.

Introduction

The social facilitation of eating refers to increases in food intake when people eat together as compared to when they eat alone. Although our interest is in people, it is worth noting that social facilitation has been demonstrated in other animals, going back several decades (e.g., Harlow, 1932, who cites even earlier studies); and although the literature involving other animals may have something to contribute to understanding the human case, a comparison of human and nonhuman research would take us too far afield for present purposes, as would a discussion of the social facilitation of drinking (see Stroebele & de Castro, 2004, for a review of the drinking literature).

Zajonc (1965, p. 269) notes that social facilitation of behavior is the "oldest paradigm of social psychology," dating back to Triplett's (1897) work on the effects of the mere presence of others. Zajonc (1965) identifies two main circumstances conducing to social facilitation – audience effects (when people behave in front of a passive audience) and co-action effects (when people behave along with others engaged in the same behavior). In the domain of eating, it turns out that increased food intake occurs only in the so-called co-action paradigm. In the audience paradigm, people usually eat dramatically less (see the section on *Noneating Observers* in Herman, Roth, & Polivy, 2003 review). Zajonc, in 1965, did not have access to any studies involving noneating observers; indeed, in 1965 there were as yet no audience or co-action studies of eating in humans. Subsequent research on the social facilitation of eating in humans focuses exclusively in the co-action paradigm; if food intake were diminished in the presence of others, as happens in the audience paradigm, modern researchers would not consider this to be a variation on social facilitation, which they regard, by definition, as an enhancement of intake. Below we will encounter some examples of social suppression of eating, which sometimes occurs in the co-action paradigm, especially when one is eating with strangers.

In this paper we will examine the extent (and limits) of the social facilitation (i.e., the enhancement) of eating as well as the mechanism(s) responsible for the effect. Eating in the presence of other people, as occurs in social facilitation situations, must be distinguished from eating in the presence of other people in situations that are not classified as social facilitation situations but rather as situations involving other types of social influence. We have already mentioned the effect of a passive audience on eaters' intake. Another paradigm, modeling, involves eating in the presence of another person who is also eating (a co-actor), but typically this co-actor is not behaving freely but rather is an experimental confederate acting surreptitiously on instructions from the researcher to eat a specific amount. The naïve participant will typically eat more or less depending on whether the model/confederate eats more or less. In the social facilitation situation, all participants are "naïve" and are typically free to eat more or less, allowing for the operation of reciprocal influence. In some modeling studies, the two co-actors both behave freely, but almost invariably the study is concerned with the extent to which the co-actors eat similar amounts (rather than whether they eat more or less than do solo eaters). In social facilitation studies, the comparison is typically between the amounts eaten by solo eaters and eaters in groups (rather than whether the people eating in groups eat similar amounts).

For purposes of this review, we supplemented our cumulative collection of articles with a web search for articles containing "social

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facilitation" and "eating" or "food intake." The reference section of all articles was further searched for additional articles.

Evidence of social facilitation of eating

The de Castro diary studies

Although not the first studies of eating in groups, John de Castro's diary studies (see de Castro, 1997a, for a review) have a certain historical primacy inasmuch as it was he who first used the term "social facilitation" to describe the increase in food intake that occurs when people eat together.[1] de Castro began the diary studies in the mid-1980s (e.g., de Castro & Kreitzman, 1985; de Castro, McCormick, Pedersen, & Kreitzman, 1986), instructing participants to keep a weekly diary in which various aspects of food intake, including the social circumstances surrounding the meal, were recorded. Various definitions of meals were used, employing different criteria for minimum amount eaten and intervals between eating bouts, but these different definitions usually provided similar data, and de Castro would focus on a "representative" example, typically a minimum of 50 kcal in a bout of eating separated from other bouts by 45 minutes.

The specific influence of the presence and number of other people on food intake was first explored by de Castro and de Castro (1989), who found that people eating in groups ate substantially (on average, 44%) more than did people eating alone. "The number of people present, then, appears to be a major factor associated with the amount eaten in a meal and to be independent of other factors affecting meal size. . . The addition of the number of people present to the regressions . . .more than doubl[ed] the variance [in food intake] accounted for" (p. 243). de Castro and Orozco (1990) reported the same positive association between group size and per capita food intake. de Castro, over the course of a series of studies (and reanalyses), concluded that social facilitation was the single most powerful influence on eating, and that "the number of people eating with the subject . . .is the best predictor of how much food an individual will consume" (Redd & de Castro, 1992, p. 749). Apparently, when de Castro began the diary studies, he was not especially focused on the social facilitation of eating: "neither the subjects nor the experimenter were aware at the time of data collection that the presence of other people at the meal was of particular interest" (de Castro & Brewer, 1991, p. 124). This admission was offered as a preemptive defense against any accusation that de Castro was looking for evidence of social facilitation and was thus biased in favor of finding it. Instead, it appears that de Castro became so impressed with the power of social facilitation at least partly because he was *not* expecting it and it was therefore especially surprising to him. (We experienced a similar "epiphany" when we found that modeling effects overrode hunger as a determinant of intake; Goldman, Herman, & Polivy, 1991.)

de Castro, Brewer, Elmore, and Orozco (1991) examined whether the social facilitation effect might be artifactual. For instance, meals that tend to be larger (e.g., dinner as compared to breakfast, or meals eaten in a restaurant as compared to at home) also tend to be the meals eaten with others; or meals eaten with alcohol (which may increase food intake or at least overall energy intake) tend to be meals eaten with others; or snacks (which tend to be small) are more likely to be eaten alone than are meals (which tend to be larger). de Castro et al.'s (1991) data, however, indicate that the social correlation (i.e., the correlation between the number of people eating and the amount eaten [per capita]) is positive in all scenarios, including breakfast, snacks, meals eaten at home, and meals eaten without alcohol. Therefore, the social correlation is not artifactual and indeed appears to be ubiquitous. "On the basis of these findings it would seem reasonable to conclude that social facilitation of eating is the most important and all pervasive influence on eating yet identified" (p. 100). Feunekes, de Graaf, and van Staveren (1995a), on the other hand, concluded from their own diary data that whereas there was an overall correlation between group size and intake, it was artifactual, a reflection of increasing intake from earlier to later meals over the course of the day along with an increasing number of other eaters from earlier to later meals over the course of the day. The Feunekes et al. data, admittedly, are from a relatively small sample with perhaps inadequate power to detect a within-meal social correlation.

One possible consideration that might limit our own astonishment at the size and ubiquity of the social facilitation effect is that the diary studies were largely cumulative; that is, the studies were not based on entirely independent samples but rather consisted of a growing database of diary entries. By the time of de Castro (1994), the sample size had grown to more than 500 participants. In other words, to some extent de Castro's social facilitation studies are really based on one data set. Still, that cumulative data set kept proclaiming the same robust message.

de Castro (1991) continued the effort to eliminate artifactual interpretations of the social facilitation effect. In this analysis, he examined whether the social correlation obtains for both weekday-only meals and weekend-only meals, to rule out the possibility that the social correlation arises because people eat more on the weekends and are also more likely to eat with others on the weekend. Although people ate (12%) more on the weekends, and ate with (41%) more people on the weekends, the social correlation was strong for both weekdays ($r > .3$) and weekends ($r = .3$–$.4$) separately, indicating that the social facilitation of eating is not an artifact of people eating more with more people on weekends. Also, the correlations between meal size and prior and subsequent meal sizes were negligible; thus, it is not the case that people schedule meals with (many) others when they are most hungry.

Explorations of the social correlation

de Castro and de Castro's (1989) social correlation – the correlation between intake and the specific number of people present at the meal –was an impressive .42. This correlation was not significantly reduced (.30) when lone eaters were excluded from the analysis; in other words, the effect was not simply a matter of people in groups eating more than lone individuals; rather, the more other people with whom one ate, the more one ate. In subsequent diary studies in this series, the social correlation remained strong, usually between .3 and .4.

de Castro and Brewer (1991), noting that the data underlying the social correlation were not perfectly linear, applied a more formal mathematical calculation and concluded that the best description of the relation between the number of people present and intake was a decelerating curve, essentially a power function, similar to what Latané (1981) had described in his "social impact theory," in which the presence of others has a cumulative effect, but the incremental size of the effect declines as the number of additional "others" increases. "One other person present at the meal was associated with a 28% increase in meal size while 41%, 53%, 53%, 71%, and 76% increases were associated with 2, 3, 4, 5, and 6 or more people, respectively" (de Castro & Brewer, 1991, p. 124). In de Castro and Brewer's analysis, "the geometric mean of the exponents for those [meal intake] variables that are best fit by the power function is 0.22" (p. 122). (The data also support an exponent with a central tendency of .23, which is the value that de Castro, 1995 provides.) de Castro and Brewer reject the possibility that a ceiling effect on intake might be responsible for the shape of the curve, arguing

[1] Schlundt and Zimering (1988) found that both obese and normal-weight people reported difficulty controlling their food intake in social situations, but this observation was more or less parenthetical.