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Eating a meal is associated with elevations in agreeableness and reductions in dominance and submissiveness

Marije aan het Rot [a,*], D.S. Moskowitz [b], Zoe Y. Hsu [c], Simon N. Young [c]

[a] Department of Psychology and School of Behavioral and Cognitive Neurosciences, University of Groningen, Netherlands
[b] Department of Psychology, McGill University, Montreal, QC, Canada
[c] Department of Psychiatry, McGill University, Montreal, QC, Canada

HIGHLIGHTS

- We examined the effects of having a meal on interactions with others.
- Study participants repeatedly reported how they felt, behaved, and perceived others.
- Overall, social interactions during a meal were more positive than other interactions.
- Shared meals are characterized by affiliative bonding and less display of hierarchy.

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ABSTRACT

Many studies have shown that having a meal together with others increases food intake. In contrast, the effects of having a meal on interactions with others have rarely been examined. More specifically, it is unknown if having a social interaction during a meal alters how people feel, behave, and perceive others.

In the present study, 98 working individuals provided information on their everyday social interactions over a three-week period by filling in a form soon after each interaction. Record forms included items representing mood state, interpersonal behaviors, and perceptions of interaction partners. Participants also indicated whether interactions took place during a meal.

Engaging in an interaction that involved eating a meal was associated with decreased alertness and, particularly in women, with increased pleasant affect, compared to interactions that did not involve eating a meal. Independently of this, during a meal participants reported fewer dominant and submissive behaviors and more agreeable behaviors, and also perceived interaction partners as more agreeable. These results were largely independent of contextual factors such as the gender and role of the primary social interaction partner, the presence of multiple partners, and the location of the interaction.

Overall, social interactions during a meal were more positive in terms of how people felt, behaved, and perceived others. At the same time, agentic behaviors were reduced. These results suggest that shared meals are events in which affiliative bonds are strengthened in the context of weakened displays of hierarchy.

1. Introduction

Eating with others is a universal phenomenon [1]. In humans, feasting goes back at least 12,000 years [2]. As might be expected, eating with others influences eating behavior. Both in laboratory settings [3] and in daily life [4], food intake is usually greater when eating with others than when eating alone. Social facilitation of food intake is seen at breakfast, lunch, and dinner, for snacks as well as meals, and occurs irrespective of where the meal is eaten and whether it is accompanied by alcohol [5]. The presence of family and friends increases food intake more than the presence of other companions [6].

People eating with others adjust their food intake to that of their eating companions. For example, Goldman and colleagues found that participants in a laboratory study ate little when confederates ate little, even after 24 h of food deprivation [7]. This mimicry of eating behavior has been observed with more than just total food intake. Hermans and colleagues studied female dyads eating together and found that both women were more likely to take a bite within 5 s of the other than to eat at their own pace [8]. Mimicry of eating behavior appears to be related to the desire to please others, to be socially accepted, or to maintain social harmony [9,10]. If people eating with others adjust their eating behavior in a way that may be intended to please others, then this raises

* Corresponding author at: Department of Psychology, University of Groningen, Grote Kruisstraat 2/1, 9712 TS Groningen, Netherlands.
E-mail address: m.aan.het.rot@rug.nl (M. aan het Rot).

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the question of whether they also adjust other behaviors. In the present study, we examined whether behavioral expressions of affiliation and expressions of hierarchy are altered during a meal.

The Social Behavior Inventory (SBI) was developed to measure interpersonal behavior along two dimensions, communion (ranging from agreeableness to quarrelsomeness) and agency (ranging from dominance to submissiveness) [11]. Communal behaviors serve to express affiliation and agentic behaviors serve to express hierarchy. The SBI has been administered to people eating meals together with the goal of examining how interpersonal behavior may be associated with food intake in the hospitalized elderly [12,13]. Dubé and colleagues found that when participants behaved in a more agentic way with their care providers during a meal, their total energy intake increased [13]. Additionally, the same group found that participants had a larger intake when their mealtime interactions with other patients involved more communal behavior [12]. This suggests that agency and communion during interactions that involve meals moderate how much people eat.

The SBI was developed for the intensive repeated measurement of interpersonal behavior in naturalistic settings [11] and has mostly been used in this context. An interpersonal grid for the repeated measurement of perceptions of others in terms of communion and agency was subsequently developed [14]. More specifically, Moskowitz and colleagues developed an approach for the recording of interpersonal behavior, perceptions, and mood state during interpersonal events occurring in everyday life; this method has been extensively validated [15]. In event-contingent recording studies, participants repeatedly fill in forms in response to specific recurring events, in this case social interactions as defined in Section 2.2. In the present study, we employed this event-contingent recording approach to see if social interaction events were different when working individuals were having an interaction during a meal compared to when they were having an interaction that did not take place during a meal. Since people alter their eating behavior in a way that seems designed to please others, our primary hypothesis was that participants would report more agreeableness and less quarrelsomeness during meals. We also hypothesized that their perceptions of others and mood state would be more positive.

2. Materials and methods

2.1. Participants

We used a combined sample of 97 participants recruited in the winter for a light administration study (Sample 1, $n = 59$) or in the summer for a naturalistic light exposure study (Sample 2, $n = 38$). Sample 1 data were taken from a study comparing early-morning bright light treatment to a placebo, consisting of early-morning exposure to a low level of negative ions, produced by an air purifier available in retail stores [16]; for the present study we used only the placebo data. Sample 2 data were taken from an unpublished study investigating the relation between natural exposure to bright light and social behavior. In Sample 1 (42% male) the mean age of the participants was 33.47 years (*SD*: 15.66), 58% had completed college or university, and 81% lived with others. In Sample 2 (39% male) the mean age of the participants was 33.34 years (*SD*: 10.17), 46% had completed college or university, and 71% lived with others.

Sample 1 and Sample 2 participants were recruited using advertisements in local newspapers and on local websites (e.g., McGill Classified Ads at www.mcgill.ca/classified). People who phoned and expressed interest in the study were given a detailed explanation and, if found willing to participate, invited for an interview in the laboratory. After providing written informed consent, participants were interviewed using the Structured Clinical Interview for DSM-IV, Non-Patient Edition (SCID) [17].

For both samples, the selection criteria were no current or past Axis I disorder according to the SCID [18], no significant self-reported major medical illness, no use of psychotropic medication, no pregnancy or lactation, working at least 30 h per week, and not working alone (to ensure they had a range of social interactions).

The only difference between Samples 1 and 2 with respect to participant selection pertained to the use of the Global Seasonality Scale (GSS) of the Seasonal Pattern Assessment Questionnaire [19]. Sample 1 participants were required to score between 6 and 11, which indicates mild to moderate seasonal changes in functioning and includes about one-third of the population at latitude 40N [20]. Sample 2 participants were required to score 2 or less, which indicates no or only minor seasonal changes in functioning and includes about one-fourth of the population at latitude 40N [20]. There were 97 participants in the combined data set (40 men and 57 women), of whom 58 originated from Sample 1 and 39 originated from Sample 2.

2.2. Event-contingent recording

All participants reported on their behaviors, perceptions and mood during social interactions using event-contingent recording (ECR) [11]. Sample 1 participants and Sample 2 participants did so for 20 and 21 days, respectively. Events to be recorded were defined as social interactions that occurred in person, by telephone, or via internet chatting, and lasted at least 5 min. ECR allows for the collection of intensive repeated measurements in near real-time and in the participants' own environment, thereby reducing the recall bias of retrospective self-report. The one-page ECR forms contained items assessing interpersonal behaviors, perceptions of interaction partners, and mood states, and requesting information about situational characteristics of the social interaction such as time, location, and partner gender and role. For the present study, ECR forms also included the question "Did this interaction take place during a meal?" with checkboxes for Yes and No. Participants were asked to complete forms as soon as possible after an interaction and were provided with pre-paid envelopes to mail the forms to the laboratory each day.

2.2.1. Interpersonal behaviors

We used behavior items developed by Moskowitz [11] to measure agreeableness, quarrelsomeness, dominance, and submissiveness, which correspond to the major dimensions of the interpersonal circumplex model [21]. Each dimension was represented by 12 items. Examples are "I listened attentively to the other" for agreeableness, "I discredited what someone said" for quarrelsomeness, "I set goal(s) for the other(s) or for us" for dominance, and "I spoke only when I was spoken to" for submissiveness. Participants could check or not check an item to indicate whether they had engaged in the behavior in a specific interaction.

Each record form included 3 of the 12 items for each behavioral dimension, and there were four versions of the forms that were rotated daily to prevent participants from checking the same items for every interaction. To control for individual tendencies to consistently check many or few items on the form, we calculated ipsatized scores for each of the four behaviors for each event by (i) dividing the number of checked behavioral items (between 0 and 3) by the total number of behavioral items on each form (3); and (ii) subtracting from this behavioral score (between 0 and 1) the mean score of the four behaviors combined (between 0 and 1) [11]. These ipsatized scores indicate how often agreeable, quarrelsome, dominant and submissive items were checked after adjusting for the general rate of item checking. Given that people tend to check quarrelsome and submissive items less often than agreeable and dominant items, ipsatized scores for quarrelsomeness and submissiveness are generally lower than those for agreeableness and dominance, and are frequently negative. To ease interpretation, for the analyses we multiplied all ipsatized scores by 100.

2.2.2. Perceptions of interaction partners

Participants completed this part of the record form when there was a one-on-one interaction or when there was a group interaction but the