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Research report

I'm watching you. Awareness that food consumption is being monitored is a demand characteristic in eating-behaviour experiments

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ABSTRACT

Eating behaviour is often studied in the laboratory under controlled conditions. Yet people care about the impressions others form about them so may behave differently if they feel that their eating behaviour is being monitored. Here we examined whether participants are likely to change their eating behaviour if they feel that food intake is being monitored during a laboratory study. In Study 1 participants were provided with vignettes of typical eating behaviour experiments and were asked if, and how, they would behave differently if they felt their eating behaviour was being monitored during that experiment. Study 2 tested the effect of experimentally manipulating participants' beliefs about their eating behaviour being monitored on their food consumption in the lab. In Study 1, participants thought they would change their behaviour if they believed their eating was being monitored and, if monitored, that they would reduce their food consumption. In Study 2 participants ate significantly less food after being led to believe that their food consumption was being recorded. Together, these studies demonstrate that if participants believe that the amount of food they eat during a study is being monitored then they are likely to suppress their food intake. This may impact the conclusions that are drawn from food intake studies.

Introduction

Eating behaviour is often studied under laboratory conditions. In this context, participants eat in a controlled environment and the dependent variable of interest is often meal size – the amount that people consume when offered *ad libitum* access to a food. For example, researchers have used laboratory methods to study cognitive (Higgs, 2002), social (Conger, Conger, Costanzo, Wright, & Matter, 1980) and environmental influences on food consumption (Rolls, Roe, Halverson, & Meengs, 2007). Meiselman (1992) has suggested that the laboratory creates an artificial setting that tells us about eating in an unnatural context, and that greater emphasis should be placed on studying human behaviour in realistic situations. de Castro (2000) expressed similar concerns and suggested that the artificial nature of the laboratory environment may result in researchers reaching invalid conclusions about human eating behaviour on the basis of lab studies (see de Castro, 2000).

The prospect that demand and/or experimenter effects can bias participant behaviour has been discussed extensively by social psychologists (Laney et al., 2008; Orne, 1962; Orne, Whitehouse, & Kazdin, 2000). However, in relation to studies of eating behaviour, less is known about whether participants change their eating behaviour or meal size in response to awareness that food consumption is being monitored by an experimenter. Previously, it has been suggested that the amount or way in which a person eats can act as a powerful 'self-presentation tool'. This is because we form judgements about other people based on their eating behaviour and are aware that others may do the same about us (Vartanian, Herman, & Polivy, 2007). For example, people eat smaller portions when in the company of strangers (Salvy, Jarrin, Paluch, Irfan, & Pliner, 2007a) and women may eat smaller meals to portray femininity (Mori, Chaiken, & Pliner, 1987; Pliner & Chaiken, 1990). Moreover, if others are watching, then we may make strategic food choices that can influence the impression that is formed by our observers (Berger & Rand, 2008; Guendelman, Cheryan, & Monin, 2011).

These observations highlight the possibility that eating behaviour can be modified by awareness that food intake is being monitored. Consistent with this proposition, in some studies overweight and obese individuals (who may be particularly concerned about how others perceive their eating) ate less than their lean counterparts (Salvy, Coelho, Kieffer, & Epstein, 2007b; Shah et al., 2014), which is also compatible with findings that the overweight and obese are more likely to under-report dietary intake (see Mela & Aaron, 1997). A study by Polivy, Herman, Hackett, and Kuleshnyk (1986)

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also suggests that awareness during eating may be of importance; in one condition of this laboratory study participants were made to feel more conscious of their eating behaviour and this resulted in participants reducing their food intake. Likewise, Roth, Herman, Polivy, and Pliner (2001) found that a reduction in food intake can occur merely due to the physical presence of an experimenter during a test meal. Although we presume it would be rare for a researcher to be present (although this actually does occur in some studies, e.g., Andrade, Kresge, Teixera, Baptista, & Melanson, 2012), it could be the case that mere awareness that eating behaviour is being recorded also affects meal size. Thus, although little work has specifically examined whether participants modify their food intake, if they *believe* that their food consumption is being monitored (i.e., the researcher will later record how much has been eaten), existing studies suggest this may be the case.

There are two reasons why this type of demand characteristic could be problematic for the interpretation of findings from laboratory studies. First, different research groups may use different methods, making it difficult to evaluate findings across studies. Specifically, some conceal the fact that food consumption is recorded (*e.g.*, Hermans, Larsen, Herman, & Engels, 2010) whilst others reveal this information to their participants (*e.g.*, Yip, Wiessing, Budgett, & Poppitt, 2013). Second, if participants are eating very little due to heightened demand awareness during a study, this may create an artificial floor effect on food intake. In other words, if participants experience external pressure to consume a small meal this would make it more difficult to detect an additional meaningful decrease in food consumption that might occur as a result of experimental manipulations. For example, consider a study testing whether an experimental manipulation reduces food intake. If food intake is significantly suppressed then this may limit the opportunity to observe further reductions caused by the experimental manipulation. The aim of the present studies was to assess the extent to which people adjust their food intake when they are aware that their meal size is being monitored. In Study 1 participants were provided with vignettes of typical eating-behaviour experiments and were asked if, and how, they would behave differently if they felt their eating behaviour was being monitored. In Study 2 we explored the effect of telling participants that their intake would be monitored on actual food intake.

Study 1

Overview

Study 1 was an internet survey in which we provided participants with a number of vignettes describing typical laboratory eating-behaviour experiments. In the first set of vignettes participants were asked if and how awareness that their eating behaviour was being monitored would influence their food consumption. We reasoned that this awareness might also be associated with suspicions of specific experimental hypotheses being tested. Accordingly, we included a second set of vignettes in which participants were provided with the study aim before being asked whether their food intake would be influenced by awareness of monitoring of their intake. We hypothesised that participants would report that awareness of monitoring would reduce their food consumption.

Study 1: Method

Participants

We aimed to recruit one hundred participants, but allowed for a slightly larger sample to allow for cases where participants failed to complete all of our questions. One hundred and eight participants (mean age = 20.9, $SD = 3.6$) completed the study. All were recruited via a text advertisement on online notice boards at the University of Liverpool, UK. Adverts were accessible to only undergraduate and postgraduate students and the study was described as an investigation of eating behaviour. Ninety four participants were female and 14 were male. All were entered into a small cash-prize draw. The study received ethical approval from the Research Ethics Committee at the University of Liverpool.

Procedure

After accessing the online study site, participants were told they would be provided with hypothetical scenarios and were asked to answer honestly about how they would behave. In this first section participants were asked 'You are participating in a psychology study and are provided with a bowl of cookies during the study, which you are asked to make taste ratings about. If you thought that the researcher would later measure how many cookies you had eaten (as opposed to you believing they weren't measuring this), do you think it would influence how much you would eat?' (*Monitoring of snack food intake question*) and answered by selecting 'Yes', 'No' or 'Unsure'. On the same page participants were asked 'In the above scenario, in what way would or wouldn't your behaviour change?' and given options 'I would eat the same amount of cookies', 'I would eat more cookies', 'I would eat fewer cookies' or 'Unsure'. Next, participants were asked 'You are participating in a research study taking place at lunchtime and during a task the researcher leaves you with a lunch buffet. If you thought the researcher would be keeping track of how much you'd eaten of each food (as opposed to them not measuring how much you'd eaten), do you think it would influence how much you would eat? (*Monitoring of lunch food intake question*) Participants were then asked in what way they would or would not change their behaviour using the same response formats as described above.

In the next section participants were given two hypothetical scenarios about participating in a between-subjects experiment. 'In a study you are asked to watch TV and the researcher leaves a selection of snacks and drinks. You notice there are food adverts during the TV programme and think the study might be examining whether food adverts increase how much food you eat (*TV advert hypothesis awareness question*). Participants were asked two questions: 'Do you think knowing the study aims would influence how much you would eat (Yes, No, Unsure)'? and 'In what way would or wouldn't your behaviour change? (I'd probably eat the same/more/less food than if I didn't know the aims, or Unsure)'. The next vignette was 'You are taking part in a research study and the researcher happens to leave nutritional information about a food, which indicates that the food product is high in calories. You are later served the food in question and you believe that the study is probably testing whether calorie labelling reduces how much you eat (*Food labelling hypothesis awareness question*). Participants were asked two questions: 'Do you think knowing the study aims would influence how much you would eat?' and 'In what way would or wouldn't your behaviour change?' The same response formats were used as in the TV advert hypothesis awareness question.

In the final section participants were given two hypothetical scenarios about participating in a repeated-measures experiment. Participants were first told 'You take part in a study with multiple visits to a laboratory. During these visits you rate hunger before and after being provided with a meal. You are asked to eat at a normal speed on one day, very fast on another day and very slow on another day. You think that the study is probably testing whether how fast you eat affects how much you eat. Knowing this, do you think it would influence how much you eat during any of the sessions?' Participants were also asked to indicate whether this would result in them eating more, less, the same amount of food (or unsure) during the slow and fast eating days individually (*Eating rate hypothesis*