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Seeing a meal is not eating it: Hedonic context effects differ for visually presented and actually eaten foods [☆]



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ABSTRACT

A meal usually consists of several different foods presented together. This study investigates how side dishes (vegetables/starches) affect the hedonic ratings of the main food item (meat/meat substitute) when a plate of these foods is viewed and also after the meal is eaten. The main question is whether the hedonic rating of the main food item assimilates toward the hedonic rating of the side dishes or shows contrast, moving away from the hedonic rating of the side dishes. In Experiment 1, when subjects only viewed a picture of a meal consisting of an imitation chicken tender (main food item) with either hedonically positive or hedonically negative side dishes, no effect of the side dishes was seen on the hedonic rating of the main food item. In Experiment 2, when subjects ate the meal shown in the picture in Experiment 1, hedonic contrast was found. That is, the main food item was rated as less good when simultaneously presented with more hedonically positive side dishes than when presented with hedonically negative side dishes. Thus, when a meal is eaten, foods influence the evaluation of other foods on the same plate. The same is not true when foods are presented in a picture.

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Introduction

When humans eat food they rarely eat one food item, but rather, eat a number of different foods in the context of a meal. In a meal, different foods are often presented sequentially as different courses. Many times within a course, different foods are presented simultaneously either on different dishes or on one plate. In many countries, including the United States, the main course of a meal consists of a number of foods presented simultaneously on one plate.

Recently a great deal of attention has been paid to studying the meal (see Meiselman, 2000, 2009). Studies have investigated the impact of factors such as time of day (Birch, Billman, & Richards, 1984; Cardello, Schutz, Snow, & Leshner, 2000; Kramer, Rock, & Engell, 1992) and setting (Edwards, Meiselman, Edwards, & Leshner, 2003; Meiselman, Johnson, Reeve, & Crouch, 2000) on

liking for a meal. There has also been significant research investigating how the individual components of a meal affect the overall acceptability of the meal (Hedderley & Meiselman, 1995; Rogozenski & Moskowitz, 1983; Turner & Collison, 1988). In particular, studies have looked at the relative contribution of the main dish vs. side dishes to overall meal acceptance. Rogozenski and Moskowitz (1983) found that ~50% of the variability in overall meal acceptance ratings could be explained by liking/disliking of the main dish (entrée). The starch and vegetable contributed less (16% and 12%, respectively) and the salad least (7%).

How the components of a meal interact has also been studied through the examination of the compatibility of meal components (Eindhoven & Peryam, 1959; Moskowitz & Klarman, 1977). In these studies, although compatibility of the components affected overall ratings of the combinations, overall ratings were not an additive function of the acceptability ratings of the individual components (Eindhoven & Peryam, 1959; Moskowitz & Klarman, 1977). So, if two incompatible foods are presented together as a meal (e.g., two well-liked foods such as lasagna and cole slaw) the combination will be rated lower than the ratings of the components would, otherwise, suggest. Therefore the factors that influence ratings of an overall meal are not the same as those that influence ratings of the individual components.

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In fact, there are few research studies examining how one component of a meal affects liking for another when presented together on a plate. One factor that might influence ratings of an individual component of a meal is how much another item in the meal is liked. Since some of the foods presented in a meal might be liked more than others, it is possible that the hedonic value of one food can be affected by how well liked are other foods presented in the context of the same meal. These effects of “context” foods on liking for other food items has only been examined in a few published studies (Riskey, 1982 (soup); Riskey, Parducci, & Beauchamp, 1979 (sweetened water); Schifferstein, 1995 (sweetened water); Walter & Boakes, 2009 (cordials); Zellner, Rohm, Bassetti, & Parker, 2003 (juice drinks)). In all of these studies the foods/drinks were all of the same kind (e.g., soups or juices). In addition, they were all presented sequentially, as they would be presented in courses in a meal, and hedonic contrast was found in all cases. When a more hedonically neutral food follows a more hedonically positive food, the subsequent food is liked less. When it follows a less hedonically positive food, it is liked more.

For example, Zellner et al. (2003) presented subjects with concentrated (hedonically positive) context beverages followed by diluted (more hedonically neutral) target beverages and found hedonic contrast. That is, subjects rated the less good, dilute target beverages as worse following the more hedonically positive context stimuli than when presented alone.

Hedonic contrast has also been found with stimuli other than foods when those stimuli are presented sequentially (e.g., Cogan, Parker, & Zellner, 2013 (faces); Dolese, Zellner, Vasserman, & Parker, 2005 (paintings); Parker, Bascom, Rabinovitz, & Zellner, 2008 (music); Zellner et al., 2003 (birds)). However, when stimuli are presented simultaneously, as are the foods presented on the same plate in many main courses, assimilation has been found (e.g., Geiselman, Haight, & Kimata, 1984; Wedell, Parducci, & Geiselman, 1987 – both with faces). Assimilation occurs when a stimulus is judged as more hedonically positive when presented with more hedonically positive context stimuli and as less hedonically positive when presented with more hedonically negative context stimuli.

These results suggest that assimilation might occur in everyday meals when different foods are presented together simultaneously on the same plate, but that contrast might occur when foods are presented sequentially in courses. Of course, while foods served on a plate in a real meal are viewed simultaneously they are not always eaten simultaneously. Some people combine the foods when putting them in their mouths. Others eat one of the food items at a time or alternate bites of the different food items. Such elements of “real people eating real food in real situations” (Meiselman, 1992b) stands in contrast to traditional or “controlled” lab studies of foods and meals where it is often difficult or impossible to generalize the results to cases of real life meal consumption (Meiselman, 1992a,b). These inherent factors of natural meal consumption also make it difficult to predict what effect, if any, one food will have on the hedonic evaluation of another food presented on the same plate in a real meal situation.

In addition, foods presented on a plate in a “real” meal may be evaluated by the consumer at different points during the meal. The evaluation may start prior to consumption, when the consumer views the food on the plate. At this point there is simultaneous presentation of the visual stimuli of the foods much as there was simultaneous visual presentation of the faces in Geiselman et al. (1984) and Wedell et al. (1987). Thus, one might expect that if a more hedonically neutral food is presented with more well liked foods that that food’s hedonic value might increase (i.e., hedonic assimilation). However, judging how much one will like a food from looking at it is quite different from judging the attractiveness of a face. Judging a face involves an immediate evaluation of the

stimuli at hand. Judging how much one will like the taste of a food from simply viewing it involves imagining how good the food will taste and is therefore an anticipatory evaluation.

Evaluating the foods in a meal once the meal is eaten is, again, different from the cases where foods are presented in a laboratory situation, one at a time, sequentially, and where ratings are given for each food after that one food is eaten (e.g., Zellner et al., 2003). Although a meal might be considered to be one event, occurring at a single point in time, sequential bites (in some order or another) have occurred and, often, the evaluation takes place after the food has been consumed and is visually no longer present. These judgments are actually based on the hedonic memory of the consumed foods. It is therefore difficult to predict whether foods presented in a meal affect each other in a contrastive or assimilative way, or if they influence each other at all.

It has been suggested that hedonic contrast occurs when the subjects are comparing the context and target stimuli (Stapel, Koomen, & van der Pligt, 1997; Wedell, Hicklin, & Smarandescu, 2007; Zellner et al., 2003). If subjects, when either viewing or eating food items on a plate, are comparing how much they like the different foods, one might expect contrast.

This study investigates how liked or disliked side dishes (starches or vegetables) served on a plate with a hedonically more neutral main item (a meat or, in this case, a meat substitute) will influence the evaluation of that main food item when the plate of food is viewed (Experiment 1) and when it is eaten (Experiment 2).

Experiment 1

The goal of this experiment is to see the effect of viewing two hedonically positive or negative side dishes on the hedonic rating of a more hedonically neutral imitation chicken tender when the foods are shown on the same plate. That is, will simply viewing the imitation tender with the two liked sides make people expect it to taste better (assimilation) or worse (contrast) than when it is presented with two disliked sides?

Method

Participants

Subjects were 64 undergraduate volunteers (46 females, 18 males) from Montclair State University Psychology department’s subject pool. Subjects’ mean age was 19.1 ($SD = 1.4$) years. These subjects were chosen from a larger sample of subjects ($n = 125$) and consisted of subjects who, after viewing the macaroni and cheese and potato chips, reported a mean rating for those two items that was hedonically positive or who after viewing the beets and lima beans reported a mean rating for those two items that was hedonically negative. This study was approved by the Montclair State University Institutional Review Board.

Materials

Subjects were presented with a picture of one Gardein brand Crispy Tender (imitation chicken tender) and one of two pairs of side dishes on a white Styrofoam plate (22 cm diameter). The pictures were 21×21 cm color photographs of the plate placed on a black background and pasted on a 26×26 cm piece of white posterboard. The hedonically negative (disliked sides) were two slices of canned beets (Del Monte) and two tablespoons of microwaved, previously frozen lima beans (America’s Choice). See Fig. 1. The hedonically positive (liked sides) were two tablespoons of microwaved, previously frozen macaroni and cheese (Amy’s) and three potato chips (Lays) see Fig. 2.

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