



You'll spoil your dinner: Attenuating hedonic contrast in meals through cuisine mismatch



Jacob Lahne^{a,*}, Richard Pepino^a, Debra Zellner^b

^a Drexel University, United States

^b Montclair State University, United States

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ABSTRACT

Previous research (Lahne & Zellner, 2015) has shown that hedonic contrast occurs in a multi-coursed meal such that good appetizers reduce the hedonic evaluation of an entrée. This paper extends that finding by examining whether hedonic contrast between courses served in a real restaurant meal can be attenuated or eliminated through a categorical mismatch of cuisine (Italian vs Thai). Subjects ($N = 143$) ate a meal in a University teaching restaurant in which the cuisine of the appetizer (soup) was manipulated so that it either matched (Italian *minestrone*) or did not match (Thai *tom kha*) the main course (Italian *pasta aglio e olio*). Subjects reported on their affective response to the meal. When the cuisine matched, hedonic contrast occurred: good *minestrone* caused subjects to like the same pasta – and the entire meal – significantly less. However, when the cuisine did not match there was no evidence of contrast: good *tom kha* did not depress liking ratings for the pasta dish, and in fact the overall meal was rated as *better* with the good appetizer. Thus, hedonic contrast can be attenuated by a mismatch of cuisine category. This research has important implications for restaurants, in that it both provides further evidence that main courses may be negatively affected by appetizers that are “too good”, and that actively varying the cuisine categories of dishes between menu sections may ameliorate this effect.

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1. Introduction

1.1. Meals – food in context

Over the last 75 years, most research into how subjects perceive and evaluate their food has been conducted *in vitro*; while these studies are valuable for their insight into specific mechanisms and the experimental control they can afford, their applicability to the complex, *in vivo* meal context is difficult to predict. In the last 20 years, calls have grown to change the paradigm of food and meal research and to develop research methodologies for accessing consumer perceptions *in context*, rather than in the laboratory (Meiselman, 1992, 2000, 2009).

The context in which a meal is served can influence how much the meal is enjoyed. A number of studies have found that the environment in which a meal is eaten can influence the hedonic ratings of the foods in the meal (e.g., Edwards, Meiselman, Edwards, & Leshner, 2003; Meiselman, Johnson, Reeve, & Crouch, 2000). For example, people rated their liking for Chicken a la King higher

when served in 4-star restaurant than when served in a private boarding school dining hall (Edwards et al., 2003).

The foods presented with another food either on the same plate or in another course served in a meal also provide part of the context of the meal, and can influence the hedonic rating of a food. Recent studies have shown that the hedonic value of a food can be influenced by other foods presented before that food (Lahne & Zellner, 2015; Zellner, Rohm, Bassetti, & Parker, 2003) or at the same time as that food (i.e., on the same plate: Jimenez et al., 2015). In all of these studies hedonic contrast (the movement of ratings of the target food in a direction opposite to the context food) occurs. That is, if a target food is presented either after or at the same time as a very good food, the hedonic value of the target food decreases.

For example, Lahne and Zellner (2015) asked diners to rate how much they liked a main course of pasta *aglio e olio* after eating either a good or mediocre *bruschetta* appetizer. The diners who ate the good *bruschetta* appetizer rated the pasta as less good (in fact, the mean hedonic rating for the pasta in this condition was negative) than the diners who ate the mediocre *bruschetta* appetizer.

However, as Fechner (1898, according to Beebe-Center, 1965 [1932]) pointed out and Zellner et al. (2003) have demonstrated,

* Corresponding author at: Department of Culinary Arts and Food Science, Drexel University, 101 N 33rd St, Philadelphia, PA 19103, United States.

E-mail address: jlahne@drexel.edu (J. Lahne).

for hedonic contrast to occur the stimuli to be compared must be categorically similar. Zellner et al. (2003) found that hedonic contrast caused by presenting good tasting juices before mediocre ones when both kinds of juices were called “juices”, was reduced if the good-tasting context juices were called “juices” and the mediocre test juices were called “commercial drinks”. It is therefore possible that if two courses in a meal are not thought to be categorically similar in some way, hedonic contrast might be reduced or eliminated between the courses.

1.2. Attenuating hedonic contrast

In Lahne and Zellner (2015), the experimental stimulus (*bruschetta*) was in the same category as the target (a pasta dish). By design, both of the foods were (Americanized) Italian cuisine. In addition, both of these foods were solid, carbohydrate-based dishes (based on wheat). With those two aspects of the appetizer and entrée matching, hedonic contrast did indeed occur between different courses in a meal. But often meals do not consist of conceptually coherent courses or dishes. For example, with the rise of fusion cuisine (so ubiquitous that the name has gone out of fashion) it is not uncommon to find Hawaiian *poke* on the same menu as pasta dishes and steaks. In fact, even more traditional meals have included items that are arguably conceptually distinct: soup, usually quite different by design in form and flavor from the main course to follow has been a feature of Western cuisine from service *a la russe* (Visser, 1991) to the mid-Twentieth Century standard American meal (Carroll, 2013). In Chinese cuisine, although simultaneous service of multiple dishes rather than courses is more standard, these dishes should ideally present strong contrasts in texture, taste, and appearance (Dunlop, 2013; Visser, 1991). One might even argue that the function of between-course refreshers served in Western high-cuisine as developed by the French, like salad or tart sorbets, is explicitly to interrupt comparison of a preceding dish to the following (Labensky & Hause, 2007); in other words, they might prevent hedonic contrast.

Given this common feature of meals, then, it is pertinent to ask whether hedonic contrast still occurs between courses when these courses are qualitatively different. While hedonic contrast occurred in the study by Lahne and Zellner (2015), despite the fact that *bruschetta* and pasta are not categorically the same food (i.e., they are not both pasta dishes), the dishes shared two important qualities: they are both from a generalized (and Americanized) Italian cuisine and they are both solid, carbohydrate-based dishes (based on wheat). It seems reasonable based on the existing knowledge about hedonic contrast in food to question whether this contrast could be attenuated by eliminating these commonalities.

Therefore, the current research investigates whether it is possible to attenuate or eliminate hedonic contrast in a coursed meal by inducing a category mismatch. Using the same target stimulus (main course) as Lahne and Zellner (2015) – a pasta dish with garlic and olive oil – this study manipulates the cuisine of the appetizer (stimulus) and entrée (target) so that the two courses are either from the same or from different cultural cuisines. Specifically, soups from two different cuisines were developed: *minestrone* (tomato, vegetable, and bean soup – an Italian-American cuisine match) and Thai *tom kha* (coconut-lemongrass soup – a cuisine mismatch). Two versions of each soup were developed (good and neutral) in order to determine if cuisine mismatch attenuates or eliminates hedonic contrast. These soups are also quite distinct from the main dish in that they are liquid, not solid, wheat-based carbohydrates.

Thus, the overall hypothesis of this research is that it is possible to attenuate or eliminate hedonic contrast in coursed, restaurant meals by reducing commonalities between the courses. Specifically, it is hypothesized that a mismatch in cuisine between the

appetizer and entrée (in this case, Italian-Italian vs Thai-Italian) will cause a significant attenuation or elimination of hedonic contrast. To test this hypothesis, an *in vivo* meal study was conducted at Drexel University’s Academic Bistro, a training restaurant for Drexel’s Culinary Arts and Science students.

2. Materials and methods

2.1. Participants

A total of 143 subjects (42 males and 101 females) participated in this research. They reported an average age of 32.3 years ($SD = 12.5$ years). On average, subjects reported dining out 1.7 times per week ($SD = 1.3$ times), and nine of the subjects reported experience in the restaurant industry. Samples sizes were slightly different for each treatment group: neutral *minestrone* $N = 35$; good *minestrone* $N = 40$; neutral *tom kha* $N = 37$, good *tom kha* $N = 31$.

Subjects were recruited by word-of-mouth and email advertisements from the Drexel University community. Subjects were a mix of students, faculty, and staff. They were incentivized with the promise of a free lunch; no other compensation was provided. Subjects were disqualified if they had dietary restrictions (aside from vegetarianism, as all recipes to be tested were vegetarian), food allergies, or if they had participated in the previous study (Lahne & Zellner, 2015) or tested pilot appetizers for this study.

The research design and instruments were approved by the Drexel Human Research Protections Program IRB.

2.2. Experimental meal design

In this study, all subjects were served a two-course lunch in naturalistic restaurant conditions. The first course, referred to hereafter as the “appetizer”, the context stimulus, was manipulated. The appetizers varied on two dimensions: cuisine (Italian/Thai) and quality (good/neutral). The dependent variables were the subjects’ affective responses (see Section 2.4) to the meal and its components, particularly the target stimulus, which was the second course pasta dish, hereafter the “main”. In order to incentivize participation, after completing all research questionnaires participants were also given their choice of several fresh-baked cookies prepared by the Academic Bistro kitchen; however, these cookies were not part of the experiment itself.

As discussed above (see Section 1.2), the experimental appetizers for this study were all soups, in order to differentiate them in type (solid vs liquid, no wheat-based carbohydrates) from the main: *minestrone* (an Italian soup) and *tom kha* (a Thai soup). All the soups (as the *bruschetta* appetizer in Lahne & Zellner, 2015) differed in flavor profile from the pasta entrée. The soups were readily identifiable as coming from different cultures and cuisines. *Minestrone* is a common soup in the USA and identified with Italian cuisine. *Tom kha*, while not necessarily identifiable as Thai, is identifiable to our subjects as Asian, and certainly not Italian. Participants were not told the names or cuisine-origin of the dishes. Soups were pilot-tested prior to the main study with a separate group of Drexel students ($N = 24$) to obtain versions of each that were hedonically positive or neutral (see Section 2.4 and Fig. 1, below). Thus, there were four experimental appetizers in total, detailed in Tables 1 and 2. Full recipes are available in Appendix 1.

All subjects received the same main course: *pasta aglio e olio* (pasta with oil and garlic), known to our subjects as an Italian dish, which had been developed to be hedonically neutral by Lahne and Zellner (2015). The ingredients and description for that dish can be found in that paper.

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