

Running head: EXPECTATION, CONSUMPTION, AND REVELATION

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The influence of expectation, consumption, and revelation on preferences for beer

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[Word Count: 2, 997]

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Abstract

Patrons of a pub evaluated regular beer and “MIT brew” (the same regular beer with some balsamic vinegar) in one of three conditions. One group tasted them blind (the secret ingredient was never disclosed). A second group was informed of the contents before tasting. A third group learned of the secret ingredient immediately after tasting, but prior to indicating their preference. Not surprisingly, preference for the MIT brew was higher in the blind condition than either of the two disclosure conditions. However, the timing of the information mattered substantially. Disclosure of the secret ingredient significantly reduced preference only in the before condition, when it preceded tasting, suggesting that disclosure affected preferences by influencing the experience itself, rather than by acting as an independent negative input or by modifying one’s retrospective interpretation of the experience.

Try it, you'll like it:**The influence of expectation, consumption, and revelation on preferences for beer**

The quality of an experience is jointly determined by “bottom up” processes, which reflect the characteristics of the stimulus impinging on our sensory organs, and “top down” processes, which reflect the beliefs, desires, and expectations of the percipient. The role of each can be illustrated by our perception of ambiguous figures, such as Jastrow’s famous rabbit/duck illusion. Our visual experience surely depends on what is there but may also be affected by what we expect to see. Although that image is never interpreted as a giraffe or a scorpion, it might look like either a rabbit or duck depending on which concept has been primed.

The influence of top-down and bottom-up processes has been a central theme across many domains of psychology. Visual perception is affected by prior conceptual structures, as well as by characteristics of the visual stimulus itself (Biederman, 1972; Palmer, 1975); assessments of a person’s ability are influenced by our expectations of their ability, as well as by objective performance measures (Jones et. al., 1968; Darley & Gross, 1983); judgments of extended events are driven by the quality of our experiences and the interpretation we impose on them (Brief et. al., 1993; David et. al., 1997); the enjoyment of a film is influenced by our expectations of its quality, as well as by its true quality and the conditions under which it is viewed (Klaaren, Hodges, & Wilson, 1994); and even our memories can be colored by our theories of what should have occurred, rather than what did occur (Cohen, 1981; Stangor & McMillan, 1992).

The domain of food and drinks provides a particularly fertile testing ground for researching the influence of conceptual information on subjective experiences: *Coke* is rated

higher when consumed from a cup bearing the brand logo (McClure et al., 2004), a slice of turkey is rated higher if thought to come from a popular brand than an unpopular one (Makens, 1965), *Perrier* is preferred to *Old Fashioned Seltzer* when consumed with the labels showing, but not otherwise (Nevid, 1981), preference for one's favorite beer vanishes if the labels are removed (Allison & Uhl, 1964), the presence of the word "soy" causes nutrition bars to be rated as more grainy and less flavorful (Wansink et. al., 2000), bitter coffee seems less so if consumers are repeatedly misinformed that it is not bitter (Olson and Dover, 1978), strawberry yogurt and cheese spreads are liked more if labeled "full-fat" than if labeled "low-fat" (Wardle and Solomons, 1994), and, intriguingly, people ate more vanilla ice cream if it was accurately labeled "high fat" (Bowen et. al., 1992),

Besides documenting the separate influences of top down and bottom up processes, some researchers have examined how they interact by manipulating when conceptual information is presented relative to the experience. For example, Hoch and Ha (1986) exaggerated the qualities of a J.C. Penney shirt either before or after respondents examined it and found that information provided before the evaluation caused participants to spend more time examining the fabric, and led them to evaluate the shirt more favorably than if that information followed the experience (see also Levin & Gaeth, 1988). This suggests that prior knowledge can affect the allocation of attention or use of information (such as the time spent examining the stitching). However, it remains unclear whether knowledge can also change the experience itself (e.g. the tactile quality of the material), just as it remains unclear in most taste test studies whether brand identity is just another input to one's overall evaluation (a valued attribute in its own right, like temperature or sweetness) or whether it modifies the actual gustatory experience (by affecting the tongue's chemoreceptors or the part of the brain that interprets the gustatory signal).

In the current research, we examine whether information affects perception by adding balsamic vinegar to one of two beer samples – an additive that most find conceptually offensive.¹ We compare preferences across three conditions: a blind condition in which the additive remains secret, and two disclosure conditions in which the identity of the secret ingredient is revealed either before tasting or after tasting. The after condition allows us to diagnose whether conceptual information only affects preferences or whether it changes our experience of the stimulus. To illustrate how the after condition could shed light on the interaction of top-down and bottom-up processes, suppose Allison and Uhl (1964) had included a third condition in which participants received brand information after they had sampled the five beers. If this group would rate the beers similarly to the before group (the ordinary or control condition in which participants knew which brand they were consuming), it would suggest that the brand information was a distinct separate input to evaluations – an expression of support for one’s preferred brand. If, however, the ratings of the after group would resemble the ratings of the blind group, it would suggest that brand information affects the taste experience itself, but that once the taste is established, brand information has no further influence; it would not alter the way in which respondents characterized their consumption experience.

A similar design could also be used in other studies investigating the role of affective expectations. For example, in a study by Wilson and colleagues (1989), all participants saw three truly funny cartoons, followed by three not-so-funny ones. Half of the participants were told nothing, while the other half were led to expect that all the jokes would be funny. The misinformed group rated the less funny cartoons to be just as funny as the funny ones. A

¹ To verify our assumption that people would be averse to the idea of balsamic vinegar in beer, we asked 121 patrons of The Muddy Charles, a local pub, to assess how beer would taste if balsamic vinegar were added, on a scale ranging from -10 (much worse), to +10 (much better). Eighty percent of the respondents expected that balsamic vinegar would make the beer taste worse. The mean rating was -4.03, which is significantly below 0 [$F(1,119) = 22.45, p < 0.01$].

videotape of their facial expressions suggested the positive expectations did improve their actual cartoon viewing experience, that the ratings weren't just an experimental demand effect reflecting respondents' reluctance to admit that they didn't get the cartoons that they had been told were found funny by others. Nevertheless, it would have been instructive to know how respondents would have rated the cartoons if they had received the bogus information about others' ratings after seeing the cartoons. Would their prior "unbiased" experience govern their ultimate evaluation, or would they also be affected by this delayed (mis)information?

Experimental Approach

Respondents consumed two beer samples: one unadulterated sample, and one sample of "MIT brew" containing several drops of balsamic vinegar – a beer flavoring that most participants find conceptually offensive, but which does not, at this concentration, degrade the beer's flavor (in fact, it slightly improves it). Respondents were randomly assigned to one of three conditions. In the blind condition, they tasted the two samples without any information about the contents. In the before condition, they were told which beer contained balsamic vinegar, prior to tasting either. In the after condition, they first tasted the beers, and were then told which beer contained balsamic vinegar (see Figure 1).

In comparing these conditions, we have the following tests: If top down processes play no role, the three conditions should not differ (Blind \approx Before \approx After). However, if knowledge does influence preferences, as our intuition and prior research suggest, preference should be lower in both of the disclosure conditions. Of greatest interest was the results of the after condition. If the presence of a conceptually aversive additive is an independent input to evaluations, the timing of the information would not matter, and preferences for the MIT brew

should be reduced by an equal degree in both disclosure conditions (Blind > Before \approx After). However, if expectations influence the consumption experience itself, preference for the MIT brew should be markedly lower in the before condition than the after condition (Blind \geq After > Before).

Experiments 1-3: Preferences

Our first three experiments were conducted at two local pubs: The Muddy Charles and The Thirsty Ear. Patrons were approached and asked to participate in a short study involving free beer. Those who agreed (nearly everyone) tasted two 2-oz. samples of beer: “regular” beer (Budweiser or Samuel Adams) and the “MIT brew,” which included several drops of balsamic vinegar.²

There were 388 participants in total (90 in Experiment 1, 139 in Experiment 2, and 159 in Experiment 3). In each experiment, participants were randomly assigned to one of three experimental conditions (blind, before, and after). After tasting the two samples, respondents indicated their preference between them. In Experiment 1, participants were simply asked to indicate which of the two samples they liked more. In Experiment 2, they indicated which of the two samples they would like to receive a full (10-oz) glass of. In Experiment 3, the blind condition was the same as in Experiment 2, but in the before and after conditions participants received a full (10-oz) glass of regular beer, some balsamic vinegar, a dropper, and the “secret recipe” (“Add 3 drops of balsamic vinegar per ounce and stir”). We monitored whether (and how much) balsamic vinegar participants actually added to their beer, and used this to code their

² When the control beer was Samuel Adams, we added 6 drops. When it was the lighter Budweiser, we added 4 drops. Budweiser was used in the first two experiments and Sam Adams in the third. We switched after discovering that Budweiser is not a very popular beer among our participants, many of whom even disputed whether it deserves to be called a “beer.”

preference between the two beer types. It turned out that all participants added either the exact amount of balsamic vinegar specified by the recipe or none at all, creating a binary dependent measure.

••• Figure 1 •••

Results

As can be seen in Figure 2, preference for the MIT brew was higher in the blind condition (59%) than in the before condition (30%). This difference was significant overall [$F(1, 385) = 23.15, p_{\text{rep}} = .99, \eta^2 = .057$], and for each of the three experiments individually (all $p_{\text{rep}} > .95$). More importantly, the preference for the MIT brew in the before condition was significantly lower than in the after condition, both overall [52% vs. 30%, $F(1, 385) = 13.86, p < 0.01, p_{\text{rep}} = .99, \eta^2 = .035$], and for each of the experiments individually (all $p_{\text{rep}} > .90$). By contrast, the after condition did not differ significantly from the blind condition, either overall [59% vs. 52%, $F(1, 385) = 1.17, p_{\text{rep}} = .66, \eta^2 = .003$], or for any of the individual experiments (all $p_{\text{rep}} < .56$).

••• Figure 2 •••

Together, the results show that disclosure of contents affects the preference for the MIT brew only if it precedes tasting, which suggests that preferences are influenced primarily through the effect of expectations on the taste experience itself. Respondents in the after conditions appeared content to let their experience dictate their preferences, and apparently, did not reinterpret their experience to align with the mildly unsettling news of what they had just consumed. These results are compatible with those of Levin and Gaeth (1988), who found that hamburger falsely labeled as “25% fat” received slightly lower taste ratings if that fat content was reported before tasting than if it was reported after tasting, although the difference in their

study was not significant (perhaps because people do not regard beef fat to taste bad, even if they have health concerns about eating it).

Experiment 4: Are these results obvious?

Our mothers often used creative labeling to trick us into eating something they knew we would otherwise oppose (e.g. by calling crab cakes “sea hamburgers”). They knew such deception was required to gain our consent, but that they need not maintain the lie after we had consumed the foods, and would often debrief us afterwards, with smug satisfaction (“By the way, son, in case you were wondering, “sea” means “crab.”). They suspected (correctly in most cases) that we could not “handle the truth” before eating, but could handle it after our senses had signaled that this was good stuff.

To test whether our mothers are especially clever, or whether these results are obvious, we presented Experiment 2 to sixty-eight MIT students. After describing the procedure, we told them, truthfully, that the MIT brew had been chosen over regular beer by 70% in the blind condition and 41% in the before condition, and asked them to predict the percent who chose it in the after condition, offering \$50 for the most accurate prediction.

Results

As can be seen from Figure 3, respondents could not generally predict the results. Predictions were uniformly spread over the entire interval (with some even falling outside the interval). They were not clustered near the upper range of the interval, as would be predicted if our results could be foreseen. Thus, these results are not, in fact, obvious – at least not to MIT students.

••• Figure 3 •••

General Discussion

The current work focuses on the relative importance of, and interaction between, two different bases for preferences: knowledge (top down) and experience (bottom up). The results across three experiments suggest that the information (about the presence of a conceptually offensive ingredient) influences preferences more when received before consumption than when received after consumption. The MIT brew was liked much less when respondents knew it contained balsamic vinegar than when they learned this afterward. Indeed, if revealed after consumption, disclosure of our secret ingredient did not significantly reduce preferences for our MIT brew (there were no significant differences between the blind and after conditions). Together, these results suggest that, expectations affected real time experience itself, not just people's post hoc characterization of the experience.

Our results raise several additional questions. First, how important is the temporal interval between sensory experience, the receipt of other information, and the evaluative judgment? In our experiments, negative information received after consumption did not markedly reduce evaluations of the MIT brew. By contrast, Braun (1999) found that after respondents had consumed diluted orange juice tainted with vinegar, subsequent evaluations were markedly elevated if they were later told that the orange juice was "sweet, pulpy, and pure." Her results may differ from ours because that misleading information was presented 30 minutes after drinking the orange juice, during which respondents may have partially forgotten the experience, diminishing the weight of the experience relative to the misinformation.

A second issue raised by these experiments is the speed with which conceptual attitudes align with experiences. If we are coerced or tricked into discovering that we actually enjoy some unusual food (rice pudding), food additive (balsamic vinegar), or sexual practice (fill in the blank), do we eagerly consume it at the next opportunity, or do our prior expectations linger, despite their disconfirmation? In our experiments, preferences converged with experiences after only a single trial (recall that only 20% thought balsamic vinegar would improve a beer's flavor, yet 52% in the after condition preferred the MIT brew). However, it remains unclear whether respondents in the after condition who preferred the MIT brew would continue preferring it on subsequent visits to the pub. Sometimes, a single positive taste experience may extinguish preconceptions, but in other cases, the original negative conception may linger, and gradually regain ascendance over fading taste memories. Tuorilla, Leshner and Cardillo (1994), found that expectations quickly return, even after being disconfirmed. In that study, respondents tasted normal and fat free versions of saltine crackers and pound cake. Although a blind taste test disconfirmed respondents' expectations that fat free products would taste worse, when they came back to the lab a month later, they retained their original negative impressions of those products. A study by Klaaren, Hodges, and Wilson (1992) suggests that positive expectations may also linger. In that study, students who were told they would enjoy The Immigrant (a silent film starring Charlie Chaplin) not only reported greater enjoyment, but were more likely to participate in a subsequent study involving a different Chaplin film. Moreover, their willingness to participate correlated only with their original affective expectation, and not with other manipulations of their real time experience (the comfort of the chair and the angle at which they were forced to view the film). These results suggest that hedonic theories (expectations) may sometimes outweigh hedonic experience as determinants of remembered and predicted utility.

A third challenge is to understand the specific perceptual, attentional, and cognitive mechanisms that mediate the effect of expectations on experience (or reported experience). One interpretation of our results is that people (reasonably) anticipate disliking the MIT brew, and this negative anticipatory emotion lingers to degrade their subsequent consumption experience (see Wilson & Klaaren, 1992). Another possibility, advanced by Hoch and Ha (1986), is that expectations bias informational search. They found that evaluations of J.C. Penny polo shirts were more favorable if participants were first told that the shirts were made with “great craftsmanship, styling and meticulous quality control” than if those claims were presented after participants had examined those shirts (and the shirts of competing brands). They proposed that the brand specific claims induced respondents to devote more time inspecting the J.C. Penney shirt, searching for information that confirmed the product claims. It seems unlikely that participants in our before condition spent more time consuming the MIT brew, searching for negative aspects of the experience. However, prior knowledge of the additive may have changed the way they interpreted their ambiguous beer experience (some combination of wet, bitter, sweet, sour, carbonated, and malty). When the secret ingredient was disclosed before consumption, they may have focused on the negative aspects of that multidimensional experience, and falsely attributed those negative elements to the vinegar rather than the beer. However, when the information followed the experience, they did not appear to attribute any of the bad elements of their ambiguous consumption experience to the presence of the balsamic vinegar. Thus, the malleability of our tastes is likely influenced by the timing of attitude discrepant information.

In a review of the role of sensory expectation on sensory perception, Deliza and MacFie (1996) conclude (p. 122) that “it is an immensely complex topic which has had very little

research attention.” We agree. As emphasized by our discussion, the relative influence of perceptual and conceptual inputs on overall evaluations likely depends on the timing of the information, the timing of the judgment, the particular domain, and the range of sensory and cognitive processes engaged by the particular task instructions. Thus, we are not confident that we have uncovered an opportunity to get rich selling pocket sized packets of balsamic vinegar to pub patrons. But we are confident that this experimental approach will prove intellectually profitable to those interested in the relationship between conceptual knowledge, experience, and the construction of preference.

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Figure Captions

Figure 1: A graphical illustration of the manipulation of information timing (relative to tasting and preference indication) across the three conditions (blind, before, and after).

Figure 2: Percentage of respondents indicating preference for the MIT brew across the three conditions in Experiments 1-3.

Figure 3: Distribution of respondents' predictions of the percent preferring the MIT brew in the after condition in Experiment 4. The real preferences in Experiment 2 were 70% and 41% in the blind and before conditions respectively.

Figure 1

Blind

Before

After

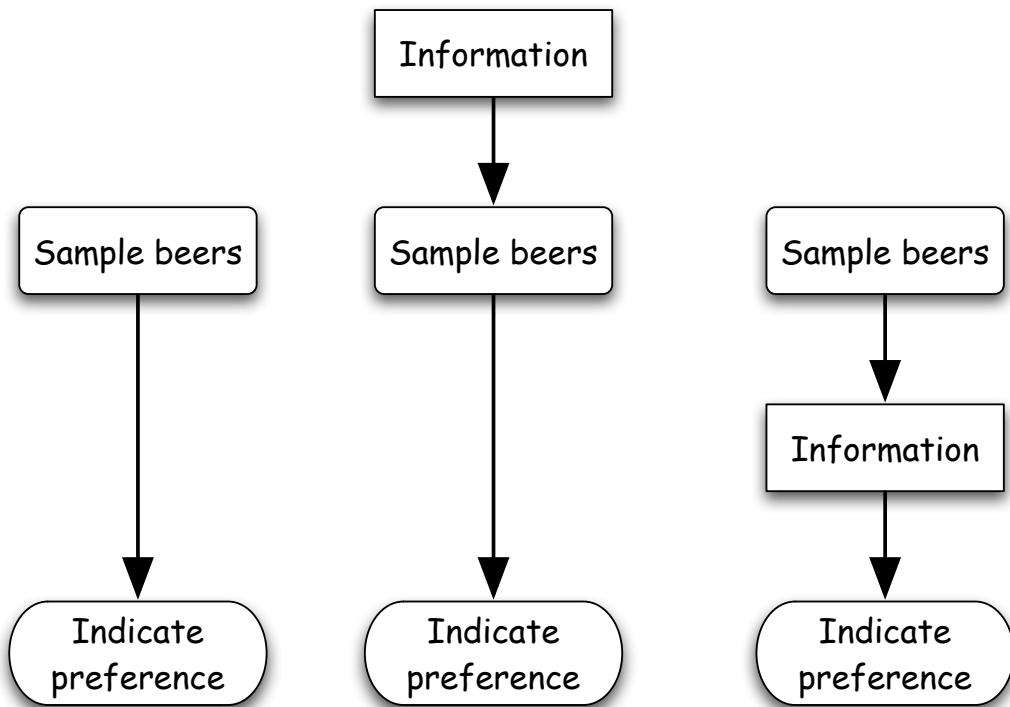


Figure 2

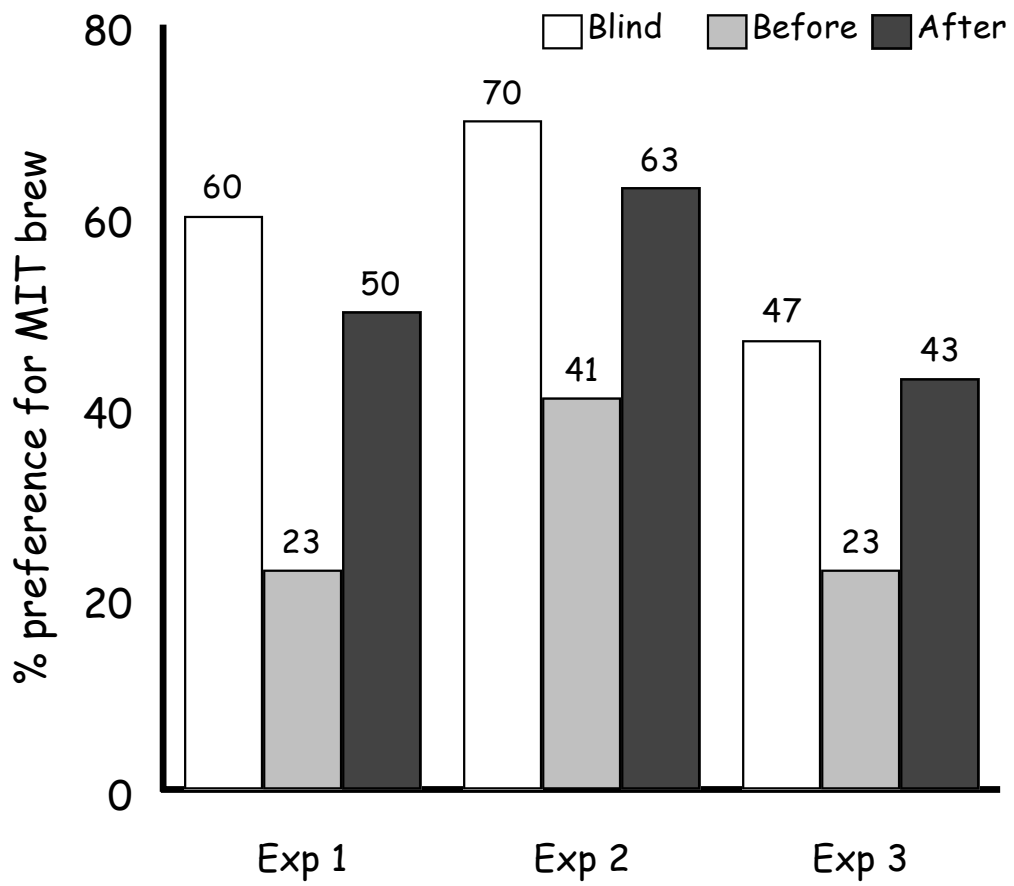


Figure 3

