

## Discrepant Beliefs About Quality and Taste

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## Discrepant Beliefs About Quality and Taste

*Abstract.* Marketers and researchers assume (sometimes implicitly) that products are vertically and/or horizontally differentiated and that consumers recognize this differentiation. Across seven studies and multiple product categories, we examine and challenge this assumption. Instead, we find that the nature of product differentiation resides within each consumer and, as a result, consumers can have starkly different beliefs about how any two given products are differentiated. These beliefs about vertical differentiation (quality) and horizontal differentiation (taste) are malleable and meaningful: considering the reasons behind others' choices can affect one's beliefs, and these beliefs are related to meaningful consumer constructs including willingness to pay, inferences based on others' choices, and self-referential language. These findings have important implications for consumer behaviors that depend on other consumers, such as herding, auctions, delegation, and search.

Some products are better than others. A water filter that removes 99.9% of bacteria is better than one that removes 90%. Other products are matters of individual taste. A blue baseball cap is neither better nor worse than a red baseball cap, yet a child who grew up with blue bedroom walls may have a strong preference for the blue cap whereas a child who grew up with red bedroom walls may have a strong preference for the red cap. These two examples define the ends of a continuum for product differentiation. The water filters are vertically differentiated: they differ in terms of quality or intrinsic value, and the product itself is the source of value. The caps are horizontally differentiated: they differ in terms of taste or idiosyncratic value, and the match between the product and the consumer is the source of value.

Many, if not most, examples are not so clear-cut. Is a student's choice between a liberal arts college and a public state university a matter of quality or a matter of taste? What about a cinephile's choice between the latest independent documentary and the latest romantic comedy? Or a wine connoisseur's choice between a bottle of pinot noir that received a 92 from *Wine Spectator* and a bottle of merlot that received a 95 from *The Wine Advocate*? We propose that the connoisseur's behavior will differ depending on whether he believes the wines are vertically differentiated (more like the water filters) or horizontally differentiated (more like the choice of baseball caps). The amount that the connoisseur is willing to pay to drink his preferred wine instead of his less preferred wine will be greater if he believes his preferred wine is better than if he believes it happens to suit his tastes. When making a recommendation, the connoisseur's reasoning will focus on the wine itself if he believes it is vertically differentiated but on himself and his audience if he believes it is horizontally differentiated. If the connoisseur observes others' choices among wines with which he is unfamiliar, he is more likely to make out-of-sample predictions if he believes their choices are driven by quality rather than taste.

In the current work, we examine discrepancies in whether consumers believe the choice between products is a matter of quality or taste and the implications of such discrepancies. We describe five key findings. First, across a broad sampling of product categories, there is substantial disagreement among consumers regarding whether any given set of products varies in terms of quality or taste. Second, consumers are more willing to pay to trade up from their less-preferred option to their more-preferred option when they believe the choice is a matter of quality (vs. taste). Third, consumers use less self-referential language when explaining a choice that they believe is a matter of quality (vs. taste). Fourth, beliefs about the source of value are somewhat malleable: explaining why someone else made a different choice, or observing that choices across consumers are not transitive, decreases the likelihood of believing the choice is a matter of quality (vs. taste). Fifth, upon observing others' choices, consumers are more likely to make out-of-sample inferences when they believe the choice is a matter of quality (vs. taste). Notably, each of the above findings holds constant the set of products.

Below, we briefly review research suggesting that different consumers may hold discrepant beliefs about the source of value of a given set of products. We develop hypotheses about the consequences of such discrepancies; we defer discussion of consumer inferences until after Study 5. We provide evidence for these hypotheses across seven studies. Throughout, we use *quality* to refer to intrinsic value that is consumer-independent and *taste* to refer to idiosyncratic value that is consumer-dependent (i.e., not to refer to discernment or refinement). We use *perceived objectivity* as imperfect shorthand to refer to the degree to which a consumer believes that a given set of options is a matter of quality rather than taste. We examine this primarily in the context of product pairs and product categories, though we expect the principle holds at the level of attributes as well; we develop this idea in the General Discussion.

## **DIFFERENTIATION AND PERCEIVED OBJECTIVITY**

Vertical and horizontal differentiation are core concepts in economics and marketing strategy. Although products may be both vertically and horizontally differentiated, the nature of differentiation is typically conceptualized as a state of the world rather than a belief of the consumer (e.g., Anderson 2008; Desai 2001; Tucker and Zhang 2011). Could the nature of differentiation for a given set of products vary by consumer? If so, pricing and product-line decisions may be affected by whether different segments hold different beliefs about the nature of differentiation for a given choice set.

The question of vertical versus horizontal differentiation, or quality versus taste, is at its core a question of perceived objectivity versus subjectivity. As people mature from early adolescence their understandings about the nature of knowledge, and in particular whether a given domain is a matter of objectivity or subjectivity, change (Kuhn, Cheney, and Weinstock 2000; Carpendale and Chandler 1996).

These differences between domains affect how people search for and interpret information. The sources sought for advice and preference for conformity vary between domains of objectivity and domains of subjectivity (e.g., Goethals and Nelson 1973; Gorenflo and Crano 1989; Olson, Ellis, and Zanna 1983; Solomon, Pruitt, and Insko 1984; Spears, Ellemers, and Doosje 2009), but this distinction is typically assumed to vary across domains, not within domain. We propose that in addition to across-domain differences, there are important differences in perceived objectivity between individuals within any given domain, and that these differences shift with the context.

Although this issue has not been directly addressed in the marketing literature, there is

suggestive evidence that within-domain differences exist from research on physical attractiveness (Ellis, Olson and Zanna 1983; Olson et al. 1983), wine (Charters and Pettigrew 2003) and morality (Goodwin and Darley 2008, 2012). We propose that consumers maintain meaningful beliefs about quality and taste, and that these beliefs vary from person to person within many different domains. Note that even the presence of such beliefs is an open question: consumers could choose based on utility without ascribing the source of that utility to quality or taste. If so, their responses and behaviors would not vary depending on their classifications. The discrepancy across consumers is also an open question. If consumers do hold such beliefs, they might maintain beliefs that are accurate reflections of the marketplace, and would thus be consistent with one another. However, if they do hold such beliefs, and these beliefs vary across consumers, these beliefs can explain a variety of correlates.

### Willingness to Pay

In normative models, the amount that an individual is willing to pay for one product over another depends on the difference in utility that he receives from the two products. Consider a consumer who is considering buying a new tie and is choosing between a red tie and a green tie. He prefers the red tie, but the red tie costs \$5 more than the green tie. For a sufficiently strong preference, the consumer will pay the extra \$5 and buy the red tie; for a sufficiently weak preference, the consumer will save \$5 and buy the green tie. The choice of whether to spend the extra \$5 for the preferred tie depends only on the strength of preference. We propose that his willingness to pay extra for the red tie will also depend on whether he prefers the red tie because he believes that it is better or because he believes it is more aligned with his tastes. Some such

differences are fair bases for price differences whereas others are not.

Consumers believe price changes and price differences that are functions of idiosyncratic consumer characteristics are less fair than those that are functions of product characteristics. A tenant who accepts a job near his apartment more strongly prefers that apartment to his next best alternative than he did before accepting the job. That should increase his willingness to pay, just as if the apartment were renovated. However, consumers believe that it is unfair for the landlord to raise the rent as a result of the tenant's new job because the increased value is due to a characteristic of the tenant, not the apartment (Kahneman, Knetsch, and Thaler 1986). Similar findings hold even when the price difference is not individually targeted: consumers believe that charging higher prices to one group because of idiosyncratic characteristics (geographic location) is unfair (Bolton, Warlop, and Alba 2003). However, consumers believe that charging higher prices for higher quality products is fair (Bolton et al. 2003).

Whether a consumer believes her preference derives from quality or taste is normatively irrelevant for her willingness to pay. However, consumers believe higher quality permits higher fair prices whereas better idiosyncratic fit does not. As fair prices increase, willingness to pay increases (Thaler 1985). We propose that holding preference strength constant, marginal willingness to pay will vary according to the perceived objectivity of the choice:

**H1:** *Consumers who believe a choice is a matter of quality will be willing to pay more to receive their chosen alternative than those who believe it is a matter of taste.*

## Consumer Explanations

Whether a choice is believed to be a matter of quality or taste is intimately related to how

consumers reason about their choices. Products that are believed to vary in terms of quality may be rank-ordered without referencing the consumer; the consumer and her tastes are superfluous. Products that vary in terms of taste, however, necessitate a match between the product and the consumer. Consumers are therefore more likely to include themselves as part of an explanation when the choice is one of taste rather than quality. As a result, there will be fundamental differences in the language consumers use to explain their choices. Holding constant the choice, consumers will use more first-person singular pronouns when explaining choices that they believe are matters of taste than when explaining choices that they believe are matters of quality.

Attribution theory (Kelley 1973) posits that people use the cues available to them to make causal judgments, and in particular that they may use different cues for matters of objectivity and matters of subjectivity. Kelley proposed that the situation is relied upon for objective truths whereas the person x situation interaction is relied upon for matters of taste. This will be reflected in language use, as references to the consumer will increase the use of personal pronouns. Explanations for choices that are represented as matters of quality should include fewer self-references than explanations for choices that are represented as matters of taste.

**H2:** *Consumers who believe a choice is a matter of quality will use fewer first-person singular pronouns when explaining their choices than those who believe it is a matter of taste.*

Our first five studies demonstrate differences in beliefs about pairs of brand across a wide variety of product categories. We observe the relationships between choice set beliefs and willingness to pay and between choice set beliefs and self-references. Throughout, we report all data exclusions, all manipulations, and all measures in each study. All sample sizes were determined in advance, with the exception noted in Study 6.



## STUDIES 1, 2, AND 3

Studies 1, 2, and 3 test how perceived objectivity relates to willingness to pay and to self-references. We examine a broad range of choices within a substantively important domain: brand choice. Rather than cherry-picking particularly ambiguous examples, we deliberately vary the category by selecting leading brands from sixteen different product categories, ranging from beer to package delivery services to cars, to test whether these effects hold over a broad set of categories (Lynch 1982; Wells 2001). In each case, we test whether perceived objectivity explains willingness to pay and self-references above and beyond differences in preference strength and perceived consensus.

### Method

*Participants.* Participants from Amazon's Mechanical Turk were recruited for Study 1 ( $N = 200$ ; 64 women, median age of 27), Study 2 ( $N = 200$ ; 85 women, median age of 27), and Study 3 ( $N = 200$ ; 92 women, median age of 30); no one participated in more than one of the studies.

*Stimuli.* Studies 1-3 used the same set of 16 brand pairs, with one pair from each of 16 product categories. These brands were selected as leading brands from 16 widely differing product categories (beer, clothing store, sedan, soda, smartphone, gas station, credit card, moisturizer, hotel, search engine, digital camera, television, fast food, shoes, laptop, and package delivery service). Complete materials for one category are given in Appendix A.

*Design and Procedure.* Studies 1-3 used nearly identical procedures. We begin by

describing Study 1 and then briefly describe the changes in Studies 2 and 3. First, each participant chose one brand from each of a randomly selected set of 4 pairs drawn from the set of 16 brand pairs. The task was to choose the brand one would rather use if the products were equated on price (*Choice*). After choosing four brands (one from each pair), participants reported their strength of preference for each choice on a 1 to 7 scale from “Very weak” to “Very strong” (*Preference Strength*). Next, participants provided an open-ended explanation of why they chose each option that they did (*Explanation*).

After participants provided explanations, the choices were shown again and for each pair, participants reported whether one option was objectively better than the other or whether it was a matter of taste (*Perceived Objectivity*); participants also had the opportunity to report that they did not know enough to judge. There were four response options for each category: (1) “[Brand A] is objectively better than [Brand B]”; (2) “[Brand B] is objectively better than [Brand A]”; (3) “Neither one is objectively better, it is a matter of opinion”; (4) “I do not know enough about [Brand A] and [Brand B] to judge.” The first two are coded as matters of quality and the third is coded as a matter of taste. Because participants made these judgments after they provided all four explanations, their explanations could not have been affected by being asked this question.

Next, participants indicated how many other participants out of 100 would choose the same option for each choice (*Perceived Consensus*). Participants then indicated how much they would be willing to pay to trade their less-preferred option for their more-preferred option in a specific context (*WTP*). Finally, participants completed the Ten Item Personality Inventory (TIPI; Gosling, Rentfrow, and Swann 2003) and all participants reported household income, sex, age, and ethnicity. The TIPI was not predictive of our measures and will not be discussed further.

Study 2 was the same as Study 1 except that the wording of the taste response to the

*Perceived Objectivity* item was randomized between-subject to be either “matter of taste” or “matter of personal preference.” Wording did not interact with beliefs, so results are collapsed across the two wordings. The TIPI was not measured in Study 2.

Study 3 was the same as Study 1 except that rather than explaining their own choice in the *Explanation* item, participants were randomly assigned to explain the choice of another same-sex participant who chose the same alternative (consistent condition) or the other alternative (discrepant condition); for Study 3, sex was measured at the beginning of the study to enable this manipulation. We discuss the effects of the Study 3 manipulation following Study 5.

## Results

*Perceived Objectivity.* There was a roughly equal split between matters of quality (Study 1: 39%; Study 2: 44%; Study 3: 41%) and matters of taste (Study 1: 47%; Study 2: 43%; Study 3: 50%). “I do not know” responses were infrequent (Study 1: 14%; Study 2: 13%; Study 3: 9%) and are excluded in the analyses below. Responses indicating that the unchosen option was better than the chosen option were very rare (Study 1: 1%; Study 2: 2%; Study 3: 1%).

The most striking result from these categorizations is the extent of disagreement. It is not the case that all participants believe one choice is a matter of quality and another is a matter of taste. Instead, some participants believe one choice is a matter of quality and others believe that same choice is a matter of taste. Of the informed responses, the average minority response (the lesser of quality or taste responses, and therefore bounded between 0 and 50%) was substantial (Study 1: 35%; Study 2: 39%; Study 3: 37%), indicating substantial disagreement for each choice. See Figure 1.

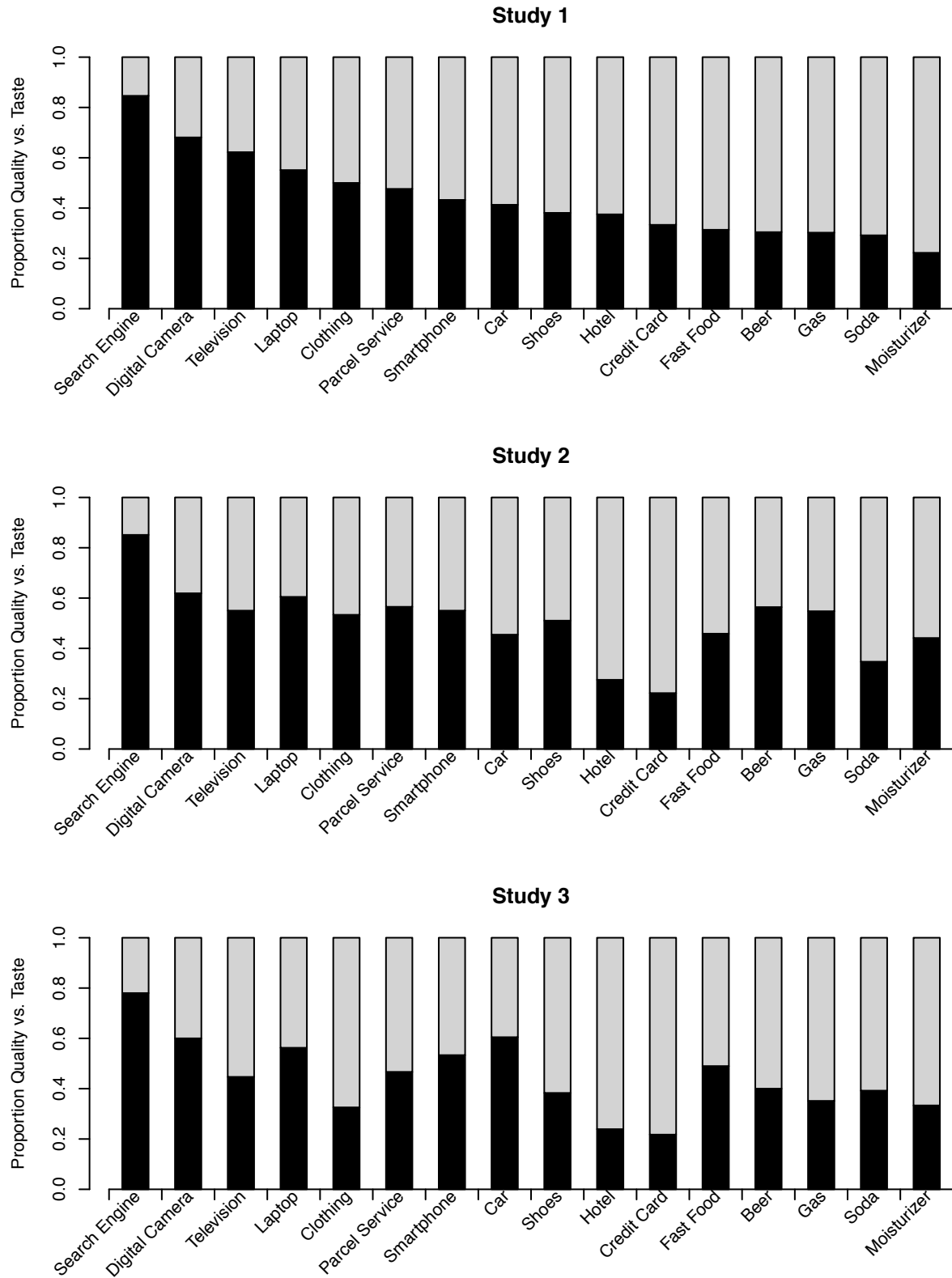


Figure 1. Proportion quality (black) versus taste (gray) by category in Studies 1, 2, and 3.

In addition to finding evidence that beliefs differ across consumers within domain, we also find evidence that there is some commonality in beliefs within-consumer across domains (i.e., evidence of individual heterogeneity). For every participant-choice observation ( $N = 800$  in each study), we calculated the average perceived objectivity across that participant's other choices ( $PO_{Other}$ ). For example, if a participant believed choices 1 and 2 were matters of taste, choice 3 was a matter of quality, and did not know enough about choice 4 to judge,  $PO_{Other}$  would take on values of 0.5, 0.5, 0, and 0.33, for choices 1, 2, 3, and 4, respectively.

We then analyzed Perceived Objectivity, with participant-choice as the level of observation, as a function of product category and  $PO_{Other}$ ; in Study 3, we also controlled for condition. This analysis excluded “do not know” responses as well as all observations of participants with three “do not know” responses, since  $PO_{Other}$  is missing for these participants. In all three studies,  $PO_{Other}$  was a strong predictor of Perceived Objectivity (Study 1:  $B = 1.34$ ,  $SE = 0.26$ , Odds Ratio = 3.82, Wald Chi-Square = 27.26,  $p < .0001$ ; Study 2:  $B = 1.98$ ,  $SE = 0.25$ , Odds Ratio = 7.22, Wald Chi-Square = 67.60,  $p < .0001$ ; Study 3:  $B = 2.25$ ,  $SE = 0.25$ , Odds Ratio = 9.50, Wald Chi-Square = 81.87,  $p < .0001$ ). Other methods of assessing consistency lead to the same conclusion: not only do beliefs within a product category differ across consumers, but beliefs about one product category are related to beliefs about other, effectively unrelated product categories.

*Analysis Plan.* Each analysis below takes the participant-choice as the unit of observation. We analyze preference strength, perceived consensus, willingness to pay, and first-person singular pronoun use (percentage of words) as a function of whether the participant reported that the choice set was a matter of taste (coded 0) or quality (coded 1). To account for differences in choice category, we include 15 dummies for choice category and 15 dummies for

chosen option nested within choice category. To account for non-independence of observations, we include participant-specific random intercepts and cluster-robust standard errors. To examine whether perceived objectivity provides unique explanatory variation beyond preference strength and perceived consensus, we include as covariates preference strength (for variables other than preference strength) and perceived consensus (for variables other than preference strength and perceived consensus). See Appendix B for details and Table B1 for full results. Results are robust to alternative specifications.

Because the models include choice category dummies, the estimated effects of perceived objectivity may be interpreted as within-category effects averaged across categories. That is, we do not contrast categories that tend to be believed to be matters of quality against those that tend to be believed to be matters of taste. The reported analyses exclude the interactions between choice category and perceived objectivity for clarity. Preliminary analyses tested for these interactions; the rare significant interactions that were found are described below.

*Strength of Preference Ratings.* Using the model described above, we examined how strength of preference varied as a function of perceived objectivity, controlling for product category and chosen option. Participants held stronger preferences for choices that they believed were matters of quality rather than matters of taste (Study 1:  $B = 1.14$ ,  $SE = 0.14$ ,  $t(655) = 8.23$ ,  $p < .0001$ ; Study 2:  $B = 1.31$ ,  $SE = 0.13$ ,  $t(660) = 10.45$ ,  $p < .0001$ ; Study 3:  $B = 1.01$ ,  $SE = 0.11$ ,  $t(690) = 9.20$ ,  $p < .0001$ ). Put differently, in each pair, those believing that preference was a matter of quality had preferences more than 1 point stronger on a 7-point scale.

*Perceived Consensus.* We analyzed consensus estimates on a 0 to 100 scale using the same model as above, plus preference strength. Controlling for preference strength, participants believed that a greater proportion of participants made the same choices that they did when they

believed the choices were matters of quality rather than matters of taste (Study 1:  $B = 7.71$ ,  $SE = 1.38$ ,  $t(654) = 5.58$ ,  $p < .0001$ ; Study 2:  $B = 8.63$ ,  $SE = 1.53$ ,  $t(659) = 5.63$ ,  $p < .0001$ ; Study 3:  $B = 8.22$ ,  $SE = 1.31$ ,  $t(689) = 6.29$ ,  $p < .0001$ ). In Study 2, there was a significant interaction between perceived objectivity and category on perceived consensus ( $F(15, 644) = 2.04$ ,  $p < .05$ ), driven by an unexpected significant reversal for the gasoline category. That reversal did not replicate in Studies 1 or 3, so we do not attempt to explain it. These differences are important in and of themselves, but because we propose that perceived objectivity is something more than just preference strength and perceived consensus, we control for these differences in each analysis.

*Willingness to Pay.* Willingness to pay (WTP) was positively skewed, so we use the natural log of (WTP+1) as our measure of interest for Studies 1, 2, and 3. Participants were more willing to pay for their preferred options when they believed the choices were matters of quality rather than taste (Study 1:  $B = 0.37$ ,  $SE = 0.14$ ,  $t(653) = 2.62$ ,  $p < .01$ ; Study 2:  $B = 0.53$ ,  $SE = 0.15$ ,  $t(658) = 3.57$ ,  $p < .001$ ; Study 3:  $B = 0.71$ ,  $SE = 0.16$ ,  $t(687) = 4.31$ ,  $p < .0001$ ). These correspond to 45%, 70%, and 103% increases in WTP, respectively. In Study 3, the relationship between perceived objectivity and WTP differed significantly across product categories ( $F(15, 672) = 2.37$ ,  $p < .01$ ), but there were no significant reversals (15 categories had positive signs, 1 category had a negative sign with  $p > .9$ ). Effects tended to be larger for higher-priced items (e.g., sedan, television, laptop). When all values were rescaled to range from 0 to 1 within-category, the main effect replicated whereas the interaction did not. Raw means of log WTP are shown by category and belief in Figure 2.

*Personal Pronoun Use.* We operationalized self-references in Studies 1 and 2 by measuring the percentage of words in each explanation that were first-person singular pronouns using the word-counting program LIWC2007 (Pennebaker, Booth, and Francis 2007).

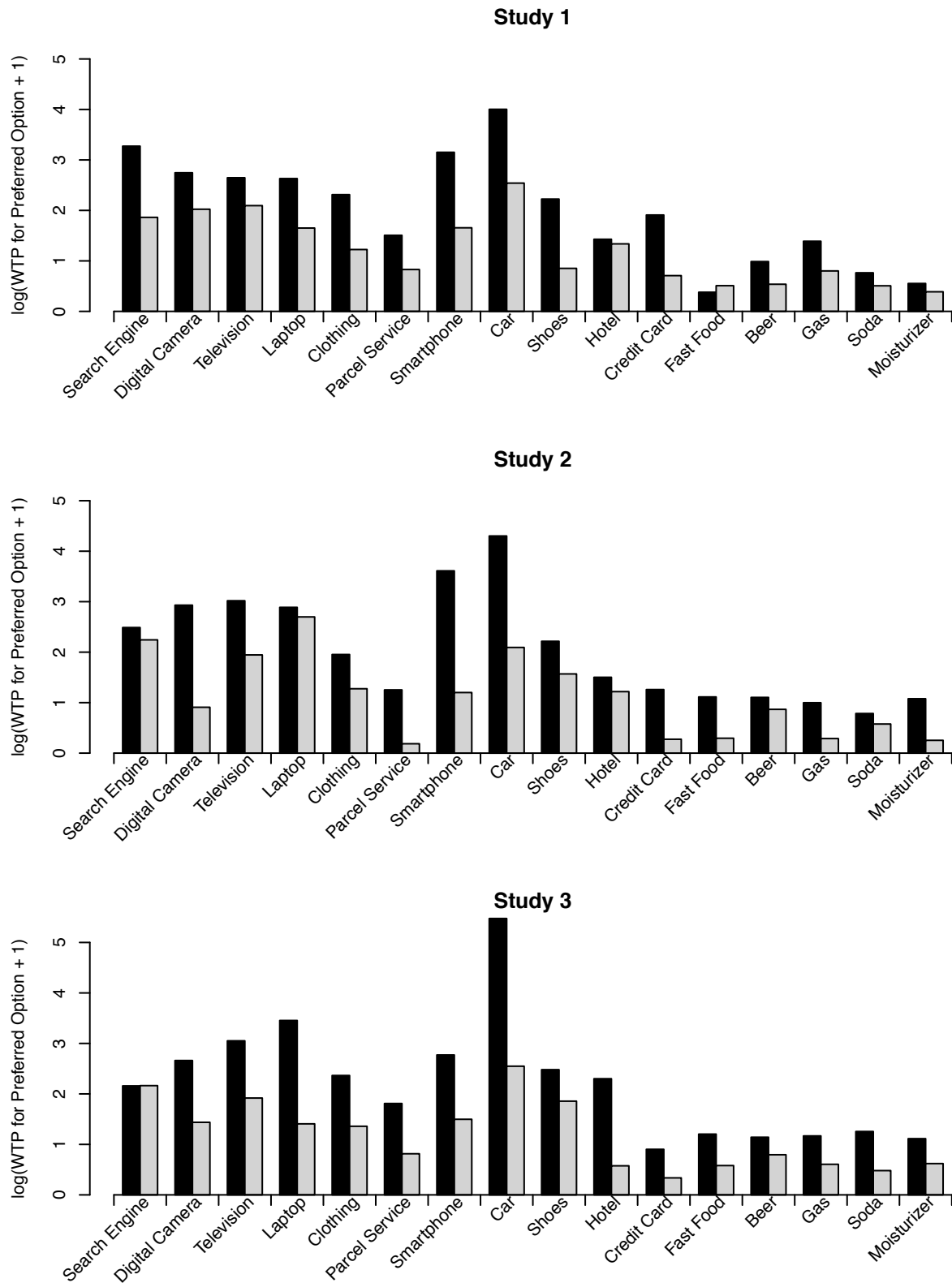


Figure 2. Log(willingness to pay for preferred option + 1) by category as a function of perceived objectivity (quality: black; taste: gray) in Studies 1, 2, and 3.

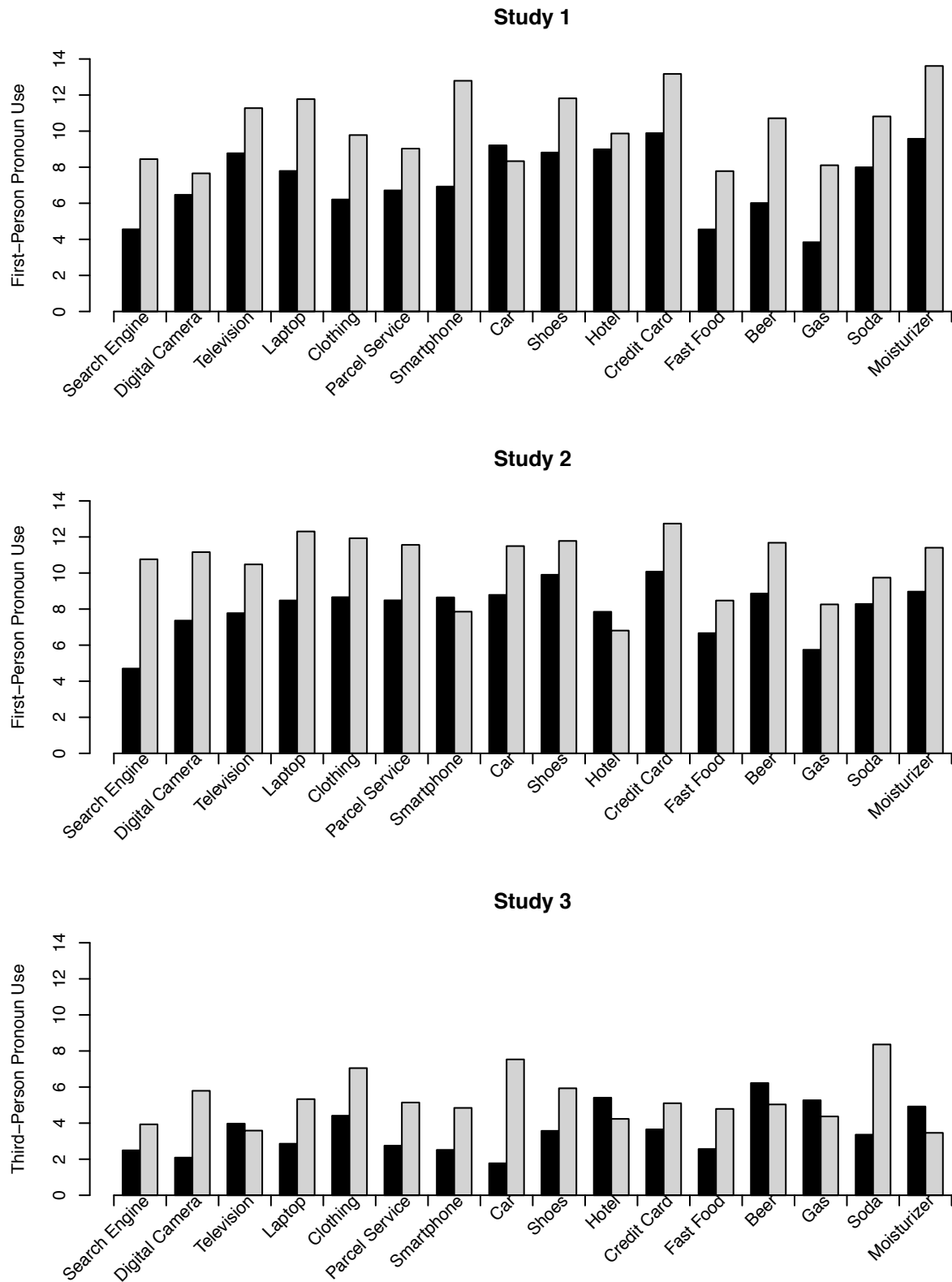


Participants referenced themselves less when they believed the choice was a matter of quality rather than taste (Study 1:  $B = -1.96$ ,  $SE = 0.59$ ,  $t(653) = -3.35$ ,  $p < .001$ ; Study 2:  $B = -2.49$ ,  $SE = 0.71$ ,  $t(657) = -3.50$ ,  $p < .001$ ). On average, 9.22% of the words in an explanation in Study 1 and 9.36% of the words in an explanation in Study 2 were first-person singular pronouns, making these substantively large effects. In Study 3, when participants explained *others'* choices, we did not find significant support for our expectation that we would see less use of third-person singular pronouns for quality than for taste ( $B = -0.51$ ,  $SE = 0.51$ ,  $t(688) = -1.00$ ,  $p = .3$ ). On average, only 4.52% of the words in an explanation in Study 3 were third-person singular pronouns. Raw means of personal pronoun use are shown by category and belief in Figure 3.

## Discussion

In our first three studies, we provide evidence for H1 and H2. When consumers make choices from sets that they believe are matters of quality rather than matters of taste, they are more willing to pay for their preferred option over another option and they use fewer self-references when explaining their choices. Each of these relationships holds controlling for the choice category, the particular option chosen, preference strength, and perceived consensus.

These data also rule out three otherwise-plausible alternative interpretations of what our perceived objectivity measure meant to our subjects. First, does perceived objectivity merely mean a very strong preference? No. Goodwin and Darley (2008, 2012) show that strength of agreement is predictive of perceived objectivity of moral beliefs, and in our data, matters of quality are associated with stronger preferences than matters of taste, but these are nonetheless distinct constructs. All results in Studies 1, 2, and 3 hold controlling for preference strength, and



*Figure 3.* Personal pronoun use (as a percentage of total words) by category as a function of perceived objectivity (quality: black; taste: gray) in Studies 1, 2, and 3.

preference strength is not predictive of personal pronoun use. Perceived objectivity uniquely explains variance. Studies 4 and 5 continue to show dissociation.

Second, does perceived objectivity merely mean that other consumers agree on the chosen option? No. Matters of quality are associated with greater perceived consensus than matters of taste (which is important in its own right), but all results in Studies 1, 2, and 3 hold controlling for perceived consensus. Studies 4 and 5 continue to show dissociation.

Third, does perceived objectivity mean that some tastes are better tastes, but they are still matters of taste and not matters of quality? No. While we do not measure this possibility directly, this explanation would not predict the pattern of first-person pronoun use that we predict and observe. Moreover, participants in Studies 1, 2, and 3 are given the opportunity to explicitly classify a choice set as a “matter of opinion” (Studies 1, 3) or “matter of taste” or “matter of personal preference” (Study 2), which clearly encompass meta-preferences.

Two key findings are worth emphasizing. First, there are considerable discrepancies across consumers regarding the perceived objectivity of each choice across a wide variety of product categories. Discrepant beliefs are not held by a negligible minority, but instead by more than a third of the sample on average in Studies 1, 2, and 3. For any given choice, not only do consumers disagree on which option is best, but also on whether one can be called best.

Second, this distinction is not merely an artificial label constructed by the researchers, but rather reflects real underlying differences in the way that consumers reason about their choices. Language use is an unobtrusive measure, and such language use varies substantially and significantly as a function of perceived objectivity. As the explanations were recorded before perceived objectivity was measured, participants were not using a researcher-enforced classification system to structure their explanations. This indicates that they are not mere labels

that are applied without real consequences, but rather represent fundamental differences in consumer beliefs and mental representations.

## STUDIES 4 AND 5

Studies 4 and 5 use alternative measurement of perceived objectivity to further demonstrate that beliefs matter and that these relationships are robust across different operationalizations. This allows us to more strongly rule out preference strength by offering participants more complete explanations of how these relationships differ from one another. In addition, we allow participants to report a continuum of perceived objectivity in Studies 4 and 5 rather than the categorical classification used in Studies 1, 2, and 3.

### Study 4

*Method.* Participants from Amazon's Mechanical Turk were recruited for Study 4 ( $N = 199$ ; 75 women, median age of 27). Study 4 methods were the same as Studies 1 and 2 with the changes noted here. Only one product pair was used (2014 Toyota Camry vs. 2014 Honda Accord), and minor wording changes were used throughout. Our original preference strength and taste items (using the "personal preference" wording from Study 2) were assessed at the end rather than the beginning. At the end of the survey, we did not measure the ten-item personality inventory, but we did measure closed-mindedness using the eight-item subscale of need for closure (Webster and Kruglanski 1994).

The key difference was that a new measurement of quality and taste was introduced.

After providing an open-ended explanation, participants were shown a square with the left border labeled “High Quality” at the top and “Low Quality” at the bottom, and the top border labeled “Good Match for Me” on the left and “Poor Match for Me” on the right. Participants were given an example of how to use the square (see Appendix C). They then indicated where their chosen option belonged and, in a new square, where their unchosen option belonged. Coordinates for each option were converted onto two 0 to 1 scales: one representing fit, where 0 represented “Poor Match for Me” (far right) and 1 represented “Good Match for Me” (far left), and one representing quality, where 0 represented “Low Quality” (bottom) and 1 represented “High Quality” (top). These coordinates were used to calculate, for each participant, average quality of the two cars, average fit of the two cars, difference in quality between the two cars, and difference in fit between the two cars.

*Results.* All analyses use data from 163 participants (exclusions are described in Appendix C). Results are given in Table 1. Both difference in fit and difference in quality were large, significant predictors of preference strength. This indicates that participants were using the instrument appropriately and that each dimension was approximately equal in assessing preference strength. Although somewhat inconsistent with Studies 1, 2, and 3, both difference in fit and difference in quality were also large, significant predictors of perceived consensus.

Log (WTP+1) was regressed on average quality of the two cars, average fit of the two cars, difference in quality between the two cars, and difference in fit between the two cars. Difference in quality was a strong significant predictor, but difference in fit was not. Note that this is not due to a difference in measurement precision, as difference in fit reliably predicted preference strength. Further, if perceived objectivity were merely a proxy for preference strength or perceived consensus in Studies 1, 2, and 3, we would not observe in Study 4 distinct effects of

quality and fit on WTP but common effects of quality and fit on preference strength and perceived consensus.

We regressed use of first-person singular pronouns on average quality of the two cars, average fit of the two cars, total difference between the two options (absolute difference in quality plus absolute difference in fit), and proportion of that difference that was due to fit (see Appendix C for an explanation of why this is the proper measure). Conceptually replicating Studies 1 and 2, total difference between the two options did not explain variance in use of first-person singular pronouns, but proportion of that difference that was due to fit did.

	Preference Strength	Perceived Consensus	Log(WTP+1)	Personal Pronoun Use
Intercept	1.02 (0.76)	42.09**** (6.12)	2.04 (1.88)	7.57* (3.24)
Average Fit	2.34** (0.79)	9.53 (6.35)	-1.54 (1.95)	1.91 (2.99)
Average Quality	1.91** (0.69)	5.48 (5.54)	2.80 (1.70)	-3.25 (2.58)
Difference in Fit	1.73*** (0.44)	9.18* (3.58)	0.69 (1.10)	
Difference in Quality	2.15**** (0.52)	9.49* (4.22)	3.69** (1.20)	
Total Absolute Difference				-1.04 (1.31)
Proportion Due to Fit				5.34** (1.74)

*Note.* \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . \*\*\*\*  $p < .0001$ .

*Table 1.* Parameter estimates from Study 4 results; standard errors in parentheses. Column heads denote dependent variables; row labels denote independent variables. The means and standard deviations were as follows. Average Fit:  $(0.61 \pm 0.16)$ ; Average Quality:  $(0.72 \pm 0.19)$ ; Difference in Fit:  $(0.42 \pm 0.29)$ ; Difference in Quality:  $(0.16 \pm 0.25)$ ; Total Absolute Difference:  $(0.61 \pm 0.36)$ ; Proportion Due to Fit  $(0.69 \pm 0.29)$ .

## Study 5

Our theory suggests price fairness is a key part of why objectivity is associated with greater willingness to pay. In Study 5, we measure fair prices. We also use a different continuous measure of perceived objectivity for robustness. In devising this measure, we gave participants specific instructions regarding how quality and taste differ from one another to ensure that they

do not merely interpret “objectively better” as merely “a very strong preference”. Further, we consider unfamiliar alternatives in a familiar product category and systematically vary the attributes to influence the structure of the products within the same category. This allows us to test whether beliefs may vary across different product pairs within the same product category.

*Method.* Participants from Amazon’s Mechanical Turk were recruited for Study 5 ( $N = 201$ ; 78 women, median age of 31). This study included one product class from Studies 1, 2, and 3, hotels, and provided limited information about three unfamiliar options (labeled Hotels J, K, and L). See Appendix D for relevant materials. This information included TripAdvisor ratings on location, sleep quality, rooms, and service, and a list of amenities offered. The three hotels were identical on location, sleep quality, and amenities and varied on rooms and service. They were structured to represent a combination of what marketers would typically refer to as vertical and horizontal differentiation. Hotel J received a three (out of five) on both rooms and service. Hotel K received a five on service but a three on rooms. Hotel L received a five on rooms but a three on service. Hotels K and L were each vertically differentiated from Hotel J on one dimension (rooms or service) but horizontally differentiated from each other (with K specializing in service and L specializing in rooms).

All participants reported on all three pairs of Hotels (J/K, J/L, K/L). The measures we took were similar to the previous studies with the following exceptions. First, preference strength was measured on a 100-point slider rather than a 7-point scale. Second, before measuring open-ended willingness to pay to trade one option for another, we also measured fair prices for each option using sliders that ranged from \$50 to \$350. Third, we used a different measure of perceived objectivity. After assessing WTP, rather than a dichotomous measure or perceptual map, for each pair of hotels, participants indicated on an unnumbered slider (coded from 0 to

100) the degree to which the choice was a matter of objective quality or a matter of personal preference. Before doing so, participants read instructions explaining how to use the scale, making clear the distinction between perceived objectivity and preference strength and how matters of quality differ from matters of personal preference. See Appendix D for details. As in Study 4, we also measured closed-mindedness.

*Results.* The current design allows us to test the Hotel J/K and Hotel J/L metrics (where the difference is structured to be vertical) against the Hotel K/L metrics (where the difference is structured to be horizontal). Perceived objectivity was greater for the J/K and J/L choices than the K/L choice ( $M = 31.82$ ,  $SD = 41.87$ ,  $t(200) = 10.77$ ,  $p < .0001$ ), log willingness to pay for the preferred option was higher for the J/K and J/L trades than the K/L trade ( $M = 0.36$ ,  $SD = 1.18$ ;  $t(200) = 4.25$ ,  $p < .0001$ ), difference in fair prices were greater for the J/K and J/L pairs than the K/L pair ( $M = 26.04$ ,  $SD = 35.00$ ;  $t(200) = 10.55$ ,  $p < .0001$ ), and consumers used fewer first-person singular pronouns when explaining their J/K and J/L choices than when explaining their K/L choices ( $M = -3.76$ ,  $SD = 5.45$ ,  $t(200) = -9.79$ ,  $p < .0001$ ). At an aggregate level, these stark differences in differentiation were indeed reflected in our measures of interest.

As in Studies 1-3, we test the relationships with perceived objectivity for each choice in a combined model with participant-choice as the unit of observation. This analysis accounts for choice and chosen option fixed effects, participant random effects, cluster-robust standard errors, and controls for preference strength and perceived consensus. Full results are reported in Table B2 in Appendix B. Perceived objectivity is associated with greater (log) willingness to pay for one's preferred alternative ( $B = .0037$ ,  $SE = .0016$ ,  $t(594) = 2.27$ ,  $p < .05$ ), greater differences in fair prices ( $B = 0.102$ ,  $SE = .045$ ,  $t(594) = 2.25$ ,  $p < .05$ ), and greater use of first-person singular pronouns ( $B = -0.027$ ,  $SE = .0076$ ,  $t(594) = -3.58$ ,  $p < .001$ ).



Providing support for the notion that objectivity is reflected in willingness to pay via fair prices, there is an indirect effect of perceived objectivity via difference in fair prices on willingness to pay (here, willingness to pay is kept in raw dollars to align with the unit of measurement of fair prices;  $B = .0118$ ,  $SE = .0072$ , 95% percentile-based bootstrapped confidence interval based on 1,000 bootstrapped samples =  $[-.0005, .0272]$ ). One route by which perceived objectivity is related to willingness to pay is via the difference in fair prices.

## Discussion

As in Studies 1, 2, and 3, Studies 4 and 5 show that perceived objectivity predicts willingness to pay for one's preferred option and self-references. As before, preference strength and perceived consensus cannot account for these effects. Results in Study 5 persist controlling for preference strength and perceived consensus. In Study 4, both preference strength and perceived consensus were equally associated with match as with quality, yet perceived objectivity uniquely predicted willingness to pay and self-references.

In addition, our measurement in Studies 4 and 5 did not rely on dichotomous classifications and did provide participants with additional information about the meaning of objective quality versus personal preference. Even when the difference was made explicit, the effects persisted, indicating it is not merely misinterpretation by participants of "objective better" as "I have a very strong preference".

Further, Study 5 provides initial evidence that not only is willingness to pay higher when the difference is seen to be one of objective quality, but fair prices differ more when the difference is seen to be one of objective quality. This evidence agrees with our theorizing that

better products may fairly command higher prices, leading to higher willingness to pay.

## RECONCILING DISCREPANT CHOICES

We have argued that consumers differ in their beliefs regarding whether a given choice is a matter of quality or taste. Are these beliefs malleable? Kuhn et al. (2000) argue that conceptualizations of knowledge change over time as individuals mature; we posit that these may also change on a context-to-context basis. People are able to update their beliefs when explicitly instructed about the objectivity or subjectivity of an ambiguous domain (Olson et al. 1983); we propose one's own reasoning process can affect one's beliefs about product categories.

Specifically, we propose that people may update their beliefs when faced with making sense of others' discrepant choices. There are (at least) three possible responses to learning that another consumer made a discrepant choice on a matter of quality. First, a consumer may conclude that he was wrong and shift his response to be more in line with the other's response. Second, a consumer may conclude that the other individual is mistaken or biased (e.g., Goodwin and Darley 2008; Ross and Ward 1995; Pronin, Ross, and Gilovich 2004). We propose a third resolution: a consumer may conclude that neither consumer made a mistake, but update his belief so that he believes that the choice is a matter of taste. This is distinct from an effect of perceived consensus: even when consumers recognize that others may make different decisions, making sense of why another reasonable consumer made a discrepant choice is the active ingredient.

**H3:** *Making sense of why another consumer made a choice that differs from one's own decreases the perceived objectivity of the choice.*

We use the data from Study 3 to test this hypothesis. In Study 3, recall that participants were randomly assigned to explain another's consistent choices or another's discrepant choices. We analyzed perceived objectivity of the four choice pairs as a function of this explanation manipulation. Our dependent variable, perceived objectivity, is Matters of Quality - Matters of Taste (ranging from -4, all taste, to +4, all quality). We regressed beliefs on discrepancy (0 = consistent, 1 = discrepant), controlling for choice category through 15 dummy variables. Compared to participants who explained consistent choices, participants who explained discrepant choices believed fewer of those choices were matters of quality ( $B = -0.95$ ,  $SE = 0.37$ ,  $t(183) = -2.57$ ,  $p < .05$ ).

*Willingness to Pay.* Does discrepancy have an indirect influence on willingness to pay? We examine the effect of discrepancy (0 = consistent, 1 = discrepant) on average log willingness to pay via perceived objectivity. To remove the confounding influence of choice category, we include 15 dummy variables as covariates to account for which of the 16 choices participants were confronted with. Each analysis used Hayes' (2013) PROCESS macro with bias-corrected confidence intervals based on 10,000 bootstrapped samples.

Explaining another's discrepant choice decreased log WTP by decreasing perceived objectivity (indirect effect:  $B = -0.16$ ,  $SE = 0.07$ , 95% CI: [-0.32, -0.05]), reflecting a decrease in WTP of 15%. The direct effect was not significant ( $B = -0.21$ ,  $SE = 0.16$ ,  $t(182) = -1.31$ ,  $ns$ ), providing evidence for indirect-only mediation (Zhao, Lynch, and Chen 2010). The total effect of the manipulation on log WTP was negative ( $B = -0.37$ ,  $SE = 0.17$ ,  $t(183) = -2.20$ ,  $p < .05$ ): explaining discrepant choices led to lower WTP.

*Third-Person Singular Pronoun Use.* Participants in the two conditions wrote about different topics (consistent vs. discrepant choices) and the dependent variable (pronoun use) may

have preceded the mediator (perceived objectivity) so although we present the analysis on use of third-person singular pronouns for completeness, the results should be interpreted with caution. Explaining another's discrepant choice increased use of third-person singular pronouns by decreasing perceived objectivity (indirect effect:  $B = 0.41$ ,  $SE = 0.23$ , 95% CI: [0.08, 1.02]). There was also a significant direct effect ( $B = 2.70$ ,  $SE = 0.77$ ,  $t(182) = 3.52$ ,  $p < .001$ ), providing evidence for complementary mediation (Zhao et al. 2010). The total effect of the manipulation on language use was significantly positive ( $B = 3.11$ ,  $SE = 0.77$ ,  $t(183) = 4.05$ ,  $p < .001$ ); that is, discrepant choices led to more use of third person singular pronouns to explain choices.

This additional evidence from Study 3 indicates that perceived objectivity is malleable. This change in representation can account for the effects of making sense of others' discrepant choices on willingness to pay.

## **CONSUMER INFERENCES**

Sometimes consumers are familiar with a product category but unfamiliar with a particular set of products from that category. What can they learn about those unfamiliar products by observing others' choices? The different beliefs that consumers hold about the product category will affect the inferences they draw about what underlies a given pattern of data. Just as researchers who model choice data and allow for only vertical differentiation will draw a different set of conclusions about both products and consumers from researchers who allow for only horizontal differentiation, consumers who observe others' choices and believe the choice is a matter of quality will draw a different set of conclusions from consumers who believe the choice is a matter of taste.

Lay theories can dominate observed relationships in the data in predicting how consumers will infer missing attribute values (Broniarczyk and Alba 1994), they can moderate the extent to which consumers make inferences based on limited data (Faro, McGill, and Hastie 2010), and they can lead to opposing inferences from the same data (Cho and Schwarz 2008). The beliefs that consumers hold about how markets operate affect how they integrate new information. For example, price promotions can be indicative of good value, but they can also be indicative of low quality. When the “good value” theory is activated, consumers assess a discounted product more positively than a non-discounted product, but the reverse trend holds when the “low quality” theory is activated (Deval et al. 2013).

Given these strong effects of consumer beliefs, the perceived objectivity of a choice will determine what inferences consumers draw from others’ decisions. If a choice is believed to be a matter of quality, all consumers should choose the same product given the same choice set, so an observer can easily combine choices made by different consumers to rank the overall set of products. If a choice is believed to be a matter of taste, any two consumers need not choose the same product given the same choice set, so an observer cannot combine choices from different consumers (or at least, cannot combine them as reliably) to rank the overall set of products without making additional assumptions. If Mary chose Coca-Cola over Pepsi and Paul chose Pepsi over RC Cola, the perceived likelihood that Lisa will choose Coca-Cola over RC Cola is a function of whether soda is believed to be a matter of quality or taste.

**H4:** *Consumers who believe a choice is a matter of quality (vs. taste) will be more likely to draw rank-order inferences from others’ choices.*

If others’ choices are based on quality, then others’ choices should be transitive across consumers; if their choices are based on taste, then their choices need not be transitive across

consumers. Within an individual, however, choices for a given context should remain transitive whether they are based on quality or taste (Regenwetter, Dana, and Davis-Stober 2011). This boundary condition ensures that perceived objectivity is not merely a stand-in for the ability to make transitivity inferences.

Observing intransitive choices may also affect consumer beliefs. Just as consumers who reconcile others' choices with their own may change their belief to be one of taste rather than quality, consumers who make sense of others' sets of choices may similarly update their beliefs. For example, an interpersonally intransitive set of choices (such that Consumer A chooses Brand 1 over 2, Consumer B chooses Brand 2 over 3, and Consumer C chooses Brand 3 over 1) is incompatible with the single rank ordering required by matters of quality, but is compatible with matters of taste that may be intrapersonally transitive but interpersonally intransitive.

**H5:** *Consumers who observe interpersonally intransitive choices are more likely to believe a choice is a matter of taste than those who observe interpersonally transitive choices.*

Study 6 examines how predictions based on the same data vary according to beliefs (H4). Study 7 examines how interpersonal transitivity can shape beliefs (H5).

## STUDIES 6 AND 7

### Study 6

*Method.* Participants ( $N = 400$ , 144 women) for this study were recruited from Amazon Mechanical Turk and randomly assigned to one of two conditions (Choice Set: interpersonal,

intrapersonal). Data was collected in two rounds of 200 participants each. The decision to collect the second 200 was made after analysis of the first 200. These rounds were identical with the exception that in the first round, participants first made predictions and then reported perceived objectivity whereas in the second round, participants first reported perceived objectivity and then made predictions.

Participants read about two choices between search engines and made a prediction. In the *interpersonal* condition, they were told that Alexis chose search engine D from the set {D, E} and Benjamin chose search engine E from {E, F}. They predicted what Christine would choose from {D, F}: D (a transitive prediction), F (an intransitive prediction), or equally likely to pick either (no prediction). In the *intrapersonal* condition, Christine chose D from {D, E} and Christine chose E from {E, F}, and participants predicted what Christine would choose from {D, F}; neither Alexis nor Benjamin were mentioned. Participants also reported whether they believed the choice among search engines was a matter of objective quality or personal preference (Perceived Objectivity). Finally, all participants reported sex, age, and ethnicity.

*Results.* Order did not enter into any significant or marginal interactions, so it was excluded for clarity, but all statistical and substantive conclusions remain the same when it is included as a factor. Predictions were analyzed using multinomial logistic regression (with no prediction as the reference category) as a function of Choice Set (1 = interpersonal, -1 = intrapersonal), Perceived Objectivity (1 = quality, -1 = taste), and their interaction. For transitive predictions, there was no main effect of Perceived Objectivity ( $z = 1.11, p > .2$ ), but there was a main effect of Choice Set ( $z = -5.82, p < .0001$ ) that was qualified by a significant Choice Set by Perceived Objectivity interaction ( $z = 2.32, p < .05$ ). When the Choice Set was intrapersonal, transitive predictions did not vary with Perceived Objectivity ( $z = -0.77, p > .4$ ), but when the

Choice Set was interpersonal, participants were more likely to make transitive predictions when the domain was believed to be a matter of quality rather than a matter of taste ( $z = 2.76, p < .01$ ).

There were no effects on intransitive predictions ( $p$ 's  $> .1$ ). Cell counts are shown in Table 2.

Perceived objectivity can account for the likelihood of making transitive inferences when considering multiple consumers' choices, but not when considering a single consumer's choices.

Interpersonal Choices	Transitive Inference	No Inference	Intransitive Inference
Taste	48 (37.8%)	59 (46.5%)	20 (15.7%)
Quality	44 (62.0%)	22 (31.0%)	5 (7.0%)
Intrapersonal Choices	Transitive Inference	No Inference	Intransitive Inference
Taste	103 (83.7%)	15 (12.2%)	5 (4.1%)
Quality	65 (82.3%)	13 (16.5%)	1 (1.3%)

Table 2. Study 6 results. Percentages in parentheses signify row percentages.

## Study 7

Study 6 showed that perceived objectivity helps to explain the likelihood of making out-of-sample predictions based on others' choices. Although Study 6's results could not have been driven by transitivity causing perceived objectivity (as order of measurement did not enter into any interactions), transitivity violations may influence beliefs as well. That is, it is possible to make sense of an intransitive set of choices across consumers if one believes that the product category is a matter of taste, but not if one believes that the product category is a matter of quality. In Study 7, we manipulate interpersonal intransitivity while holding consensus information about the target products exactly the same.

*Method.* Participants ( $N = 100$ , 64 women) were recruited from Amazon Mechanical Turk and randomly assigned to one of two conditions (Choice Set: transitive, intransitive). Each participant was presented with the information that Alexis chose search engine 1 from the set {1,



2}, Benjamin chose 2 from {2, 3}, Christine chose 3 from {3, 4}, and Dennis chose either 1 from {1, 4} (in the transitive condition) or 4 from {1, 4} (in the intransitive condition). On the same page, participants made a choice for themselves from the set {2, 3} and indicated whether 2 was better than 3, 3 was better than 2 (either of which indicates matter of quality), or it was a matter of personal preference. Importantly, note that no information about 2 or 3 varied between conditions: in each condition, 2 and 3 were each chosen once and rejected once. Only Dennis's choice regarding options 1 and 4 varied between conditions, whereas the key measurement was belief about the relationship between 2 and 3.

*Results.* Beliefs were analyzed using multinomial logistic regression (with personal preference as the reference category) as a function of Transitivity (1 = transitive, -1 = intransitive). Transitive choice sets were more likely to lead to a belief that 2 was better than 3 (10/51 vs. 2/49;  $z = 2.24, p < .05$ ). There was no effect on beliefs that 3 was better than 2 (3/51 vs. 1/49;  $z = 1.10, p > .2$ ). Analogous to the results of Study 3, which showed that making sense of another participant's discrepant choice led to a greater likelihood of classifying a choice as a matter of taste, these results indicate that sets of inconsistent choices across participants may also lead to a greater likelihood of classifying a choice as a matter of taste.

## GENERAL DISCUSSION

Seven studies demonstrate that consumers hold meaningful, discrepant, and malleable beliefs about whether a given choice set is a matter of quality or taste. We next clarify how perceived objectivity varies from related constructs, discuss some distinct novel contributions, and present implications and avenues for future research.

## Differentiating Perceived Objectivity from Related Constructs

In Studies 1, 2, 3, and 5 we observed strong relationships between perceived objectivity and preference strength and between perceived objectivity and perceived consensus. As noted in the discussion to Studies 1 through 5, the evidence strongly shows that perceived objectivity is distinct from each of these constructs and that these constructs cannot account for differences in willingness to pay or personal pronoun use. Furthermore, a preference strength explanation does not make a prediction about interpersonal choice transitivity (Study 6), and interpersonal choice transitivity affects perceived objectivity, even holding consensus explicitly constant (Study 7). Perceived objectivity is distinct from preference strength and perceived consensus.

Perceived objectivity is also related to, but distinct from, attitude correctness and belief superiority. Attitude correctness refers to the extent to which one believes one's attitude regarding a given issue is the correct one to have (Petrocelli, Tormala, and Rucker 2007). A key distinction between perceived objectivity and attitude correctness is that attitude correctness refers to an attitude towards a particular option whereas believing a domain is a matter of taste or quality is about the relationships among options. In our inference studies, consumers believed the domain was a matter of quality or taste. That could not be captured by a measure of attitude correctness since the individual options were unknown and unknowable. We propose these beliefs about taste and quality may set the groundwork for attitude correctness. For example, students who believe that the differences among colleges are primarily based on quality may hold that same belief about a set of options they have never encountered (e.g., foreign colleges) even though they may not have an attitude, correct or otherwise, towards any specific foreign college. Toner et al. (2013) assess belief superiority, defined as the belief that one's belief or

position is better than another's. Like attitude correctness, belief superiority is directed towards a particular option rather than the relationships among options. This construct alone would have difficulty accounting for our findings of the effects of beliefs on consumer inferences and self-references.

## Contributions and Future Research

*Language Use as an Indicator of Taste Beliefs.* In the present work, we examine use of first-person singular pronouns as it relates to perceived objectivity. Consistently across Studies 1, 2, 4, and 5, we find that consumers reference themselves when explaining their own decisions more when they believe the domain is one of taste rather than quality (in Study 3, this effect was diminished when consumers explained others' choices). In addition to being a psychologically meaningful outcome, use of first-person singular pronouns may also be used as a metric to assess perceived objectivity where it otherwise would remain unobservable.

As a proof-of-concept, we tested whether personal pronoun use by expert critics could predict deviant evaluations. Experts assessing quality should be consistent with one another (i.e., exhibit inter-rater reliability); experts assessing taste need not be. We collected 120,352 movie review snippets by 1,998 movie critics assessing 5,045 movies from [www.metacritic.com](http://www.metacritic.com). We took two key measures from each review snippet: (1) the percentage of words that were first-person singular pronouns; and (2) the deviation of the review score (on a scale from 0 to 100) from the consensus score across all critics. If movies differ in underlying quality and expert critics assess that quality, they should be consistent with one another and exhibit small deviations from the consensus score. If movies differ in underlying quality but expert critics assess

idiosyncratic fit (as indicated by use of self-references), they need not be consistent with one another and therefore may exhibit large deviations from the consensus score. Indeed, regressing deviation on percentage of words that were first-person singular pronouns (0 to 100) revealed that greater use of self-references was associated with greater deviation from the consensus ( $B = 0.292$ ,  $SE = .022$ ,  $t(120,350) = 13.4$ ,  $p < .0001$ ). This held when random intercepts were included for movie, publication, and critic ( $B = 0.187$ ,  $SE = .021$ ,  $t = 8.72$ ,  $p < .0001$ ), even when limiting the sample to reviews that came out the day of the first review ( $n = 3,638$ ,  $B = 0.486$ ,  $SE = 0.185$ ,  $t = 2.62$ ,  $p < .01$ ) and were therefore surely not written to contrast against other reviews.

Similar results held when examining a sample of 75,757 movie reviews by 21,315 consumers, covering 3,834 movies, with ratings on a 0 to 10 scale. Again, greater use of self-references was associated with greater deviation from the consensus score ( $B = 0.0672$ ,  $SE = 0.0023$ ,  $t(75,755) = 29.69$ ,  $p < .0001$ ), including when random intercepts were included for movie and consumer ( $B = 0.0397$ ,  $SE = 0.0022$ ,  $t = 18.22$ ,  $p < .0001$ ); only 101 consumer reviews came out the day of the first consumer review, but those results are consistent as well ( $B = 0.219$ ,  $SE = 0.080$ ,  $t = 2.75$ ,  $p < .01$ ). Moreover, these differences could be accounted for by deviation from the expert scores. Regressing consumer scores on average consumer score for that movie, consensus critic score for that movie, and their interactions with self-references, including random intercepts for movie and consumer, revealed that the weight on the consensus critic score (scaled from 0 to 100) decreased with personal pronoun usage ( $B = -0.0044$ ,  $SE = 0.0003$ ,  $t = -17.27$ ,  $p < .0001$ ) whereas the weight on average consumer score (scaled from 0 to 10) increased with personal pronoun usage ( $B = 0.0231$ ,  $SE = 0.0033$ ,  $t = 6.94$ ,  $p < .0001$ ).

More broadly, language usage may be used to examine perceived objectivity in ubiquitous natural language datasets. Assessing perceived objectivity via self-references in

product reviews, social media commentary, and customer interactions has the potential to enrich our understanding of consumer beliefs even when we cannot measure them directly. In addition to the within-category differences we have emphasized throughout, similar analyses may use language use to compare the perceived objectivity across different domains or product categories, comparisons that will be of interest to many marketers.

*Naïve Realism.* People tend to believe that they see the world as it really is and that other reasonable people see the world the same way (Ross and Ward 1996; Pronin et al. 2004). One could imagine two ways to extend these findings to product evaluations. First, one may believe that one's own evaluations reflect the way the world really is. Here, one's own evaluations are projected onto others no matter their source. Alternatively, one may believe that one's own assessments of objectivity reflect the way the world really is. In this case, one's own evaluations are projected onto others if the domain is a matter of quality but not if the domain is a matter of taste. Our data support the second extension. The results from Studies 1, 2, 3, and 5 suggest that consumers perceive a greater consensus when they believe the domain is a matter of quality rather than a matter of taste. Consumers are less likely to extend their evaluations of products to others when they believe those evaluations are due to taste rather than quality (c.f. Orhun and Urminsky 2013).

*Objectivity of Attributes and Weights.* How are comparisons of quality and taste made across sets of attributes? Throughout, we have compared perceived objectivity at the level of product pairs or categories. The bases for these differences in belief may lie in the differences in “allowable” perceived benefits or weights. Consider the following stylized example:

Three consumers are choosing between Car A (white, automatic transmission) and Car B (blue, manual transmission). Compared to manual transmission, automatic transmission provides

less control but greater convenience. Compared to a white car, a blue car shows less dirt and offers different aesthetic appeal. All three consumers have strong preferences regarding the underlying benefits (and thus attributes and choices). Each prefers control to lack of control, convenience to lack of convenience, white to blue, and hides dirt to shows dirt. Each also puts little weight on control and hiding dirt and a lot of weight on convenience and aesthetic appeal, so they each strongly prefer Car A to Car B. Their beliefs about the benefits conveyed by each car and the weights they place on each benefit are listed in Table 3 along ranges that, according to their objectivity beliefs, are permissible values.

Consumer 1 allows for little variance in benefits or weights.

	Weight		Value of Car A		Value of Car B	
Control	1	{0-2}	1	{0-2}	9	{8-10}
Convenience	9	{8-10}	9	{8-10}	1	{0-2}
Hides Dirt	1	{0-2}	1	{0-2}	9	{8-10}
Aesthetics	9	{8-10}	9	{8-10}	1	{0-2}
Overall			164	{128-208}	36	{0-80}

Consumer 2 allows for little variance in benefits, but greater variance in weighting.

	Weight		Value of Car A		Value of Car B	
Control	1	{0-6}	1	{0-2}	9	{8-10}
Convenience	9	{4-10}	9	{8-10}	1	{0-2}
Hides Dirt	1	{0-6}	1	{0-2}	9	{8-10}
Aesthetics	9	{4-10}	9	{8-10}	1	{0-2}
Overall			164	{64-224}	36	{0-160}

Consumer 3 allows for little variance in weighting, but greater variance in benefits.

	Weight		Value of Car A		Value of Car B	
Control	1	{0-2}	1	{0-6}	9	{4-10}
Convenience	9	{8-10}	9	{4-10}	1	{0-6}
Hides Dirt	1	{0-2}	1	{0-6}	9	{4-10}
Aesthetics	9	{8-10}	9	{4-10}	1	{0-6}
Overall			164	{64-224}	36	{0-160}

*Table 3.* Example of objectivity in benefits conveyed and weights.

The first consumer does not allow for others to reasonably hold different beliefs about either benefits or weights, so for Consumer 1, the range of possible values of B are necessarily less than the range of possible values of A. For this consumer, it is a fact that automatic

transmission is better than manual transmission and it is a fact that Car A is better than Car B: any (in his mind) reasonable set of beliefs and preferences leads to the choice of automatic over manual and Car A over Car B. Consumer 2 holds the same beliefs about benefits and weights as Consumer 1 and the same limits on what beliefs other consumers are allowed to hold about benefits, but Consumer 2 permits greater variance in how other consumers weight different benefits. For Consumer 2, it is a fact that Car A conveys greater convenience than Car B, but differences in weights on control and convenience mean that the choice between automatic and manual transmission is a matter of personal preference, as is the choice between Car A and Car B. Consumer 3 places strict limits on how much other consumers are allowed to weight different benefits, but believes that other consumers may reasonably hold different beliefs about the benefits provided. Consumer 3 believes automatic transmission conveys greater convenience than manual transmission, but believes that other consumers may derive greater convenience from manual transmission than automatic. Even though this consumer believes other consumers must give greater weight to convenience than control, the choice between automatic and manual is a matter of personal preference because perceived benefits may vary across consumers. For the same reason, the choice among cars is not objectively determined. As this example illustrates, the perceived objectivity of a given choice may itself be multiply determined, and such discrepant beliefs may persist at the attribute level, particularly when these attributes are associated with multiple benefits that are not perfectly correlated with one another. These differences may be primarily defined at the product pair level (e.g., Study 5) or at the product category level (e.g., Study 6).

*Information Search.* Our findings suggest important implications for how consumer information search will vary within a given category depending on whether the consumer

believes the category is one of quality or taste. Drawing on social comparison theory (Festinger 1954), compared to consumers who believe a category is one of taste, those who believe it is a matter of quality may be more likely to seek advice from dissimilar others (Gorenflo and Crano 1989), be more likely to update their evaluations based on assessments by dissimilar others (Goethals and Nelson 1973), and be more interested in examining consensus information (Olson et al. 1983). Based on our findings in Study 6, consumers who believe a category is a matter of quality may be more likely to be interested in others' choices even when those choice sets do not align with their own. That is, if Sarah is deciding between Brand A and C and knows that Mary chose Brand A over B, Sarah is more likely to seek out information about Joe's choice between Brands B and C if Sarah believes the category is a matter of quality rather than taste.

*Delegated Decisions.* Consumers not only make choices for themselves, but also rely on others to make choices for them. They may defer medical decisions to their doctors' recommendations, rely heavily on a real estate agent when purchasing property, or leave their finances to the management of a financial advisor. One's willingness to delegate decisions to others will likely depend on whether the domain is believed to be a matter of quality or of taste. For matters of quality, domain expertise should matter and be beneficial, whereas for matters of taste it need not.

*Decisions in a Group Setting.* In a variety of situations, consumers' outcomes are determined by the integration of their decisions with those of others. In first-price auctions, bidders' bids are affected by their beliefs about others' values. If they believe that they value an option because it is high quality, rather than because it matches their tastes, they will be more likely to believe that others see it as a highly valued option as well, and so will increase their bid accordingly. This is akin to multiple bidders in the same auction holding discrepant beliefs about



whether the auction is a common-value or private-value auction.

Others' behavior is informative, but not always equally informative. When consumers have noisy signals about the correct choice, they can and should rely on others' behaviors. This can lead to rational herding to suboptimal options (Banerjee 1992; Bikhchandani, Hirshleifer, and Welch 1992). Consumers likely believe that others' choices are more diagnostic for their own choice when the choice is believed to be a matter of quality rather than a matter of taste. When a consumer believes a decision is a matter of quality, she is more likely to follow the herd than when she sees it as a matter of taste, even when identity motives are not at stake.

*Conclusion.* The distinction between quality and taste is a fundamental aspect of consumer life, but is typically assumed to be observable as part of the world rather than embedded within an individual consumer's beliefs about the world. In the present work, we show that these beliefs are associated with other important consumer constructs and are malleable. Drawing this distinction has implications for other consumer behaviors, particularly those in which consumers consider or depend on the behaviors of others, such as bidding, delegated decisions, and herding, and opens the door for future research on additional antecedents of beliefs about quality and taste.

## Appendix A

### Sample Materials for Studies 1, 2, 3

#### CHOICE

For each of the products below, please specify which brand you would rather use. In making these choices, please assume that there is no price difference between the two options, even though in the marketplace you might pay different prices for the different brands.

All else equal, I would rather drink a bottle of \_\_\_\_\_.

*Coca-Cola*

*Pepsi*

#### PREFERENCE STRENGTH

You said that you would rather drink a bottle of [chosen option] instead of a bottle of [unchosen option]. How strong is your preference?

*Very weak (1) to Very strong (7)*

#### EXPLANATION (SELF: STUDIES 1, 2)

You said that you would rather drink a bottle of [chosen option] instead of a bottle of [unchosen option]. Please use the space below to give 1 to 2 reasons why you made the choice that you did.

*[Open-ended text box]*

#### EXPLANATION (CONSISTENT: STUDY 3)

Another participant said that [he/she] would rather drink a bottle of [chosen option] instead of a bottle of [unchosen option]. Please use the space below to give 1 to 2 reasons why [he/she] made the choice that [he/she] did.

*[Open-ended text box]*

#### EXPLANATION (DISCREPANT: STUDY 3)

Another participant said that [he/she] would rather drink a bottle of [unchosen option] instead of a bottle of [chosen option]. Please use the space below to give 1 to 2 reasons why [he/she] made the choice that [he/she] did.

*[Open-ended text box]*

#### PERCEIVED OBJECTIVITY

You said that you would rather drink a bottle of [chosen option] instead of a bottle of [unchosen option]. Which of the following statements best describes the comparison between Coca-Cola and Pepsi?

*Coca-Cola is objectively better than Pepsi.*

*Pepsi is objectively better than Coca-Cola.*

*Neither one is objectively better, it is a matter of [opinion / taste / personal preference].*

*I do not know enough about Coca-Cola and Pepsi to judge.*

#### PERCEIVED CONSENSUS

You said that you would rather drink a bottle of [chosen option] instead of a bottle of [unchosen option]. If 100 people took this same survey, how many do you think would choose the same option as you?

*Slider labeled "People making the same choice" from 0 to 100.*

#### WTP

Now suppose that you were purchasing soda at the grocery store. The store was giving away two 12-packs, one of Coca-Cola and one of Pepsi. You were selected to receive the 12-pack of [unchosen option]. How much, if anything, would you be willing to pay to trade and get the [chosen option] instead?

\$ \_\_\_\_\_

## Appendix B

For Studies 1, 2, 3, and 5, analyses at the participant-choice level were conducted using the *plm* package in R (Croissant and Millo 2008). The models included fixed effects for product category, fixed effects for chosen option nested within product category, preference strength (for analyses other than preference strength), and perceived consensus (for analyses other than preference strength and perceived consensus). We allowed for random intercepts and cluster-robust standard errors to account for correlated errors. Across the four studies, results are robust to changes in analysis plan. Full results are in Table B1 and B2.

Study 1	Preference Strength	Perceived Consensus	Language Use	Log(WTP)
Preference Strength		B = 1.92 (0.47) t(654) = 4.13 p < .0001	B = -0.05 (0.19) t(653) = -0.26 ns	B = 0.261 (0.037) t(653) = 7.05 p < .0001
Perceived Consensus			B = -0.041 (0.017) t(653) = -2.34 p < .05	B = 0.0082 (0.0044) t(653) = 1.88 p < .06
<b>Perceived Objectivity</b>	<b>B = 1.14 (0.14)</b> <b>t(655) = 8.23</b> <b>p &lt; .0001</b>	<b>B = 7.71 (1.38)</b> <b>t(654) = 5.58</b> <b>p &lt; .0001</b>	<b>B = -1.96 (0.59)</b> <b>t(653) = -3.35</b> <b>p &lt; .001</b>	<b>B = 0.37 (0.14)</b> <b>t(653) = 2.62</b> <b>p &lt; .01</b>
Study 2	Preference Strength	Perceived Consensus	Language Use	Log(WTP)
Preference Strength		B = 1.93 (0.39) t(659) = 4.90 p < .0001	B = -0.04 (0.21) t(657) = -0.18 ns	B = 0.203 (0.043) t(658) = 4.68 p < .0001
Perceived Consensus			B = -0.008 (0.021) t(657) = -0.37 ns	B = 0.0096 (0.0038) t(658) = 2.55 p < .05
<b>Perceived Objectivity</b>	<b>B = 1.31 (0.13)</b> <b>t(660) = 10.45</b> <b>p &lt; .0001</b>	<b>B = 8.63 (1.53)</b> <b>t(659) = 5.63</b> <b>p &lt; .0001</b>	<b>B = -2.49 (0.71)</b> <b>t(657) = -3.50</b> <b>p &lt; .001</b>	<b>B = 0.53 (0.15)</b> <b>t(658) = 3.57</b> <b>p &lt; .001</b>
Study 3	Preference Strength	Perceived Consensus	Language Use	Log(WTP)
Preference Strength		B = 1.80 (0.39) t(689) = 4.65 p < .0001	B = 0.14 (0.15) t(688) = 0.93 ns	B = 0.102 (0.037) t(687) = 2.78 p < .01
Perceived Consensus			B = -0.016 (0.014) t(688) = -1.13 ns	B = 0.0125 (0.0043) t(687) = 2.88 p < .01
<b>Perceived Objectivity</b>	<b>B = 1.01 (0.11)</b> <b>t(690) = 9.20</b> <b>p &lt; .0001</b>	<b>B = 8.22 (1.31)</b> <b>t(689) = 6.29</b> <b>p &lt; .0001</b>	<b>B = -0.51 (0.51)</b> <b>t(688) = 1.00</b> <b>ns</b>	<b>B = 0.71 (0.16)</b> <b>t(687) = 4.31</b> <b>p &lt; .0001</b>

*Table B1.* Full results from Studies 1, 2, and 3. Perceived Objectivity coded Taste = 0, Quality = 1. Columns heads denote dependent variables; row labels denote independent variables. All models include fixed effects for product category, fixed effects for option chosen, random effects for subject, and cluster-robust standard errors.

Study 5	Preference Strength	Perceived Consensus	Language Use	Log(WTP)	Fair Price Difference
		B = 0.11 (.03) t(595) = 3.22 p < .01	B = -0.003 (.010) t(594) = -0.29 ns	B = 0.0135 (.0031) t(594) = 4.34 p < .0001	B = 0.202 (.055) t(594) = 3.68 p < .001
			B = -0.010 (.012) t(594) = -0.83 ns	B = 0.0033 (.0034) t(594) = 0.95 ns	B = 0.360 (.078) t(594) = 4.61 p < .0001
	<b>B = 0.11 (0.03)</b> <b>t(596) = 3.87</b> <b>p &lt; .001</b>	<b>B = 0.15 (.03)</b> <b>t(595) = 5.66</b> <b>p &lt; .0001</b>	<b>B = -0.027</b> <b>(.008)</b> <b>t(594) = -3.58</b> <b>p &lt; .001</b>	<b>B = 0.0037 (.0016)</b> <b>t(594) = 2.27</b> <b>p &lt; .05</b>	<b>B = 0.102 (.045)</b> <b>t(594) = 2.25</b> <b>p &lt; .05</b>
	<b>Perceived Objectivity</b>				

*Table B2.* Full results from Study 5. Perceived Objectivity and Preference Strength each ranged from 0 to 100. Columns heads denote dependent variables; row labels denote independent variables. All models include fixed effects for product category, fixed effects for option chosen, random effects for subject, and cluster-robust standard errors.

## Appendix C

### Instructions for taste and quality measures in Study 4

“Take a moment to consider the picture below. This picture represents what a cinephile, Alex, thinks about different movies.

Alex really likes horror movies and really dislikes animated movies. This is shown in the picture by showing horror movies on the left and animated movies on the right.

Even though he really likes horror movies, he thinks that some (e.g., "Psycho") are higher quality than others (e.g., "Manos: The Hands of Fate"). Even though he really dislikes animated movies, he thinks that some (e.g., "Toy Story") are higher quality than others (e.g., "Alvin and the Chipmunks: The Squeakquel"). This is shown in the picture by showing the movies that Alex thinks are higher quality at the top and those he thinks are lower quality at the bottom.

Alex would prefer to watch "Psycho" rather than any of the other three movies, and he would prefer to watch any movie other than "Alvin and the Chipmunks: The Squeakquel". Alex does not have a strong preference between watching "Manos: The Hands of Fate" or "Toy Story".



On the next two pages, you will be asked to use a similar picture to show what you think of a 2014 Honda Accord and a 2014 Toyota Camry.”

On the next page, participants were given a blank square like the one above and prompted “What do you think of a [chosen option]? Click inside the square to indicate where you think a [chosen option] belongs.” On a second page, they were given another blank square and prompted “What do you think of a [unchosen option]? Click inside the square to indicate where you think a [unchosen option] belongs.”

### **Participant Exclusions in Study 4**

As in Studies 1, 2, and 3, the 31 participants who indicated that they did not know enough about the options to judge whether one was better than another were excluded from analysis. Four participants had missing data because they did not indicate a position for one or both of the products, making analysis of their data impossible. One participant was nearly 4 standard deviations below the mean on difference in fit ( $-0.80$ ,  $M = 0.39$ ,  $SD = 0.31$ ), whereas all other participants were within 2 standard deviations. Examination of that participant’s open-ended response indicated that the participant intended to choose the unchosen option, supporting the decision to exclude that observation.

### **Analysis of language use**

To examine language use, the proper metric is the predominant difference rather than the difference in quality and difference in fit. For example, if two products are equally good fits, but one is believed to be either somewhat better or considerably better than the other, the degree to which they require referencing the self (i.e., not at all) is the same. Similarly, if two products are equally high quality, but one is believed to be a little bit better fit or a substantially better fit, the



degree to which they require referencing the self is the same. Examining language use as a function of difference in fit and difference in quality would not be informative in these cases.

Moreover, consider the following example:

Consumer A has a difference in fit of 0 and a difference in quality of 0.3.

Consumer B has a difference in fit of 0.3 and a difference in quality of 0.3.

Consumer C has a difference in fit of 0.9 and a difference in quality of 0.3.

A believes the choice is just a matter of quality. B believes the choice is equally a matter of quality or taste. C believes the choice is mostly a matter of taste. In other words, the difference in perceived objectivity between A and B is slightly greater than the difference between B and C.

Yet if we use a difference metric rather than a proportion metric, the difference between B and C will be estimated to be twice as large as the difference between A and B.

Nevertheless, for robustness, we also examined language use using the same model as WTP. Consistent with our reported findings, difference in quality was a negative, marginally significant predictor ( $B = -3.70$ ,  $SE = 2.12$ ,  $t(158) = -1.74$ ,  $p < .09$ ), and difference in fit was a positive, non-significant predictor ( $B = 2.07$ ,  $SE = 1.80$ ,  $t(158) = 1.15$ ,  $p > .2$ ). Similarly, consistent with our reported findings, using the language use model to analyze WTP showed that total absolute difference was a significant positive predictor ( $B = 2.24$ ,  $SE = 0.81$ ,  $t(158) = 2.76$ ,  $p < .01$ ), and proportion due to fit was a negative, marginally significant predictor ( $B = -1.89$ ,  $SE = 1.08$ ,  $t(158) = -1.76$ ,  $p < .09$ ).

## Appendix D

### Sample Materials for Study 5

Most measures in Study 5 were similar to Studies 1, 2, and 3. Fair price and perceived objectivity differed substantially and are shown below. Participants answered all items about all hotels (fair price) or pairs of hotels (all other items). The information about each hotel shown to participants is given in Figure D1.

	Hotel J	Hotel K	Hotel L
Location			
Sleep Quality			
Rooms			
Service			
Amenities	Restaurant / Bar Fitness Center Business Center Pool Room Service Free WiFi	Restaurant / Bar Fitness Center Business Center Pool Room Service Free WiFi	Restaurant / Bar Fitness Center Business Center Pool Room Service Free WiFi

Figure D1. Information participants received about Hotels J, K, and L in Study 5.

### FAIR PRICE

A four-star hotel room in this location at this time of year tends to cost between \$100 and \$300 per room per night; a few are more expensive, a few are less expensive. What do you think would be a fair price for Hotel [J / K / L] to charge customers per room per night?

*Slider labeled “Fair Price (\$)” from 50 to 350*

### PERCEIVED OBJECTIVITY

Earlier you indicated how strongly or weakly you preferred one hotel over another. Now we'd like you to think about the nature of that preference. Please read the information below carefully.

**Sometimes, people prefer one option over another because one option is objectively better than the other.** These preferences don't depend on what a person happens to like or dislike, it is simply a fact that one option is better than the other. Consider the two examples below:

1. Alex has a choice between two nearly identical water filters. Filter A filters out slightly more impurities than Filter B does. Alex would probably say that Filter A is objectively better than Filter B. The fact that it is objectively better does not depend on whether Alex thinks water quality matters a lot or a little.

2. Dylan has a choice between two nearly identical cell phones. Phone C drops slightly more calls than Phone D. Dylan would probably say that Phone C is objectively worse than Phone D. The fact that it is objectively worse does not depend on whether Dylan thinks dropped calls matter a lot or a little.

**Sometimes, people prefer one option over another because one option happens to be a better match for what they like.** Neither option is better or worse than the other, but one more closely aligns with a person's personal tastes and preferences. Consider the two examples below:

1. Chris has a choice between two nearly identical cell phones. Phone E is white and Phone F is black. Chris would probably say that neither cell phone is objectively better and that the choice is a matter of personal preference. The fact that it is a matter of personal preference does not depend on whether Chris thinks color matters a lot or a little.

2. Jordan has a choice between two nearly identical salsas. Salsa G is spicier than Salsa H. Jordan would probably say that neither salsa is objectively better and that the choice is a matter of personal preference. The fact that it is a matter of personal preference does not depend on whether Jordan thinks spiciness matters a lot or a little.

Now, think about your three hotel choices from earlier. For each choice, ask yourself the following questions:

Is this choice more like the first set of choices described above (that is, it is a fact that one hotel is objectively better than the other)? Or is this choice more like the second set of choices described above (that is, it is a matter of personal preference and neither hotel is objectively better)? Or is this choice somewhere in between?

For each choice listed, use the slider to indicate what you think about that choice. Slide it to the left if you think the choice is more a matter of personal preference, and slide it to the right if you think the choice is more a matter of objective quality.

The choice between Hotel [J/K] and Hotel [K/L] is...

*Slider labeled “Hotel [J/K] vs. Hotel [K/L]” ranging from “Completely a matter of personal preference” on the left to “Completely a matter of objective quality” on the right with “Equal parts personal preference and objective quality” in the middle.*

*[If the slider response was greater than or equal to 25 on a 0 to 100 point scale]*

You said that the choice between Hotel [J/K] and Hotel [K/L] is at least partly a matter of objective quality. If you had to say that one is objectively better than the other which one would you say is objectively better?

*Hotel [J/K]*

*Hotel [K/L]*

*[On the next page, participants were asked to report which, if any, of three product categories (Television, Cell phone, Internet browser, I do not know) was used as an example on the previous page.]*

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