

Mindful Matching: Ordinal versus Nominal Attributes

ABSTRACT

The authors propose a new conceptual basis for predicting when and why consumers match others' consumption choices. Specifically, they distinguish between ordinal ("ranked") versus nominal ("unranked") attributes and propose that consumers are more likely to match others on ordinal than on nominal attributes. Eleven studies, involving a range of different ways of operationalizing ordinal versus nominal attributes, collectively support this hypothesis. The authors' conceptualization helps resolve divergent findings in prior literature and provides guidance to managers on how to leverage information about prior customers' choices and employees' recommendations to shape and predict future customers' choices. Further, the authors find process evidence that this effect is driven in part by consumers' beliefs that a failure to match on ordinal (but not nominal) attributes will lead to social discomfort for one or both parties. Although the primary focus is on food choices, the effects are also demonstrated in other domains, extending the generalizability of the findings and implications for managerial practice and theory. Finally, the conceptual framework offers additional paths for future research.

Keywords: matching, ordinal attributes, nominal attributes, joint consumption, social influence, decision making

Recognizing the social setting of consumption, managers strive to understand how peoples' choices affect those of others. We recently conducted a survey of 52 marketing managers whose responses indicated that they believed that consumers' and employees' choices influence other consumers and that a deeper understanding of such social influence effects would be useful and important for their organizations. Generally, they believed that social influence happens. However, they were not able to articulate accurately when such influence is more likely to occur, nor were they able to accurately distinguish what aspects of products are more likely to be matched (versus not matched) to another person's choice. For instance, one manager (age 36, 11 years experience) expressed only a general belief in matching, "People tend to follow what the crowd is doing. They usually do what other people do. It is hard to discourage otherwise." Another manager (age 60, 33 years experience) also expressed this belief but thought it might not happen with some kinds of products, saying "I think if 2 people are shopping together, they may influence each other to buy the same things. But if you are picking something like a glass of wine, you would be more likely to pick what you like, not necessarily what the first person ordered." Supplemental study S1 in Web Appendix A contains details on this survey.

To understand these frequent, social, and key marketplace interactions, we propose and test a new conceptual framework for predicting *when* matching is more (and less) likely to occur in sequential social choice settings, as well as *what* is matched, based on *product attributes*. Specifically, as explained later, we distinguish between attributes that are perceived by consumers to be more ordinal (ranked) versus nominal (unranked) and predict that consumers are more likely to match others on ordinal attributes (e.g., size, brand prestige) than on nominal ones (e.g., flavor, shape).

By examining a wide range of operationalizations of both ordinal and nominal attributes

in social consumption contexts, we offer a generalizable attribute-based conceptualization that resolves the discrepancy between one stream of literature showing mimicry of others' consumption choices, and another which fails to show such a relationship. Managerially, most work in marketing continues to examine consumers' individual preferences and decisions; we highlight the importance of understanding social factors in consumption in conjunction with product attributes. We show that by neglecting to consider the distinction between different attribute types, managerial efforts to influence consumers by highlighting nominal attributes may be misguided, whereas highlighting ordinal attributes can influence consumers' choices and strategically increase revenue. Additionally, although our empirical focus is mainly on demonstrating the initial generalizability of this broad conceptualization for predicting matching, we also examine one underlying reason for ordinal attribute matching—that consumers anticipate, and want to mitigate, social discomfort from mismatching on such attributes.

Next, we define ordinal and nominal attributes, review literature on social influences in consumption contexts, and draw upon work on social comparison and social norms to motivate our predictions. We then present studies testing our predictions with various operationalizations of ordinal and nominal attributes. We conclude by discussing managerial implications, including how to (and how not to) influence consumers' choices to enhance revenue, and theoretical implications, including how our conceptualization sets the stage for future research.

CONCEPTUAL BACKGROUND

Ordinal versus Nominal Attributes

A prominent distinction exists across a variety of literatures between ordinal (akin to vertical, graduated, ranked, alignable) and nominal (akin to horizontal, unranked, non-alignable) variables. Ordinal variables involve categories for which there is a clear way to order the

categories to meaningfully determine which is greater; by contrast, nominal variables are defined as ones involving categories without any intrinsic or agreed upon way to order them (Stevens 1946). These terms, “ordinal” and “nominal,” largely mirror the “vertical” and “horizontal” differentiation distinction often used in economics and marketing, while being broader. Table 1 summarizes how these terms are used; a main contribution of our research is integrating this conceptual perspective of classifying attributes with the topic of social influence in consumption choices (see also Web Appendix Tables B1-B4).

[Insert Table 1 about here]

Social Influences in Consumption Choice Contexts

Social influences have a powerful effect on consumer decision making. Our primary focus is on understanding what a consumer selects following observing the decision of their companion, although we relax this later to include consumer-salesperson interactions for generality. Research has produced divergent findings on whether consumers match others’ consumption choices.

On the one hand, mimicry research suggests that consumers might be influenced towards their co-companions’ consumption choices—indicating matching. Matching has been shown prominently in the food context. First established in social psychology (Chartrand and Bargh 1999; Lakin, Chartrand, and Arkin 2008), (non)conscious mimicry has been observed in various consumption settings: Tanner et al. (2008) examine consumers making choices between two snack options, finding that consumers choose more of the snack that their co-consuming partner consumes, compared to an alternative snack. Further, using an anchoring-and-adjustment model, McFerran et al. (2010) find that consumers consistently anchor their portion sizes on the portions they see others select before them, although the degree of adjustment towards others varies by

the other's body size. Indeed, the idea that consumers use the quantity of food chosen by others as a strong input into their own choice is well-established (Vartanian et al. 2015). Additionally, dyads are shown to match each other's quantity of candy consumption or financial indulgence in an effort to enhance affiliation (Lowe and Haws 2014). We propose that portion size is an ordinal attribute and suggest that the well-established portion size finding may represent a broader phenomenon whereby consumers match on ordinal attributes more generally.

On the other hand, other research suggests that consumers sometimes avoid matching their co-consumers (Ariely and Levav 2000; Quester and Steyer 2010; Ratner and Kahn 2002). Ratner and Kahn (2002) find that public consumption and greater observability of one's behavior leads to greater variety-seeking because consumers believe they will be evaluated more favorably for increasing variety. Ariely and Levav (2000) find that consumers avoid matching co-consumers' beer selections in group consumption contexts, even when the co-consumers have selected one's most-preferred choice, for reasons including a desire to show uniqueness and for information gathering. Of particular interest for our theorizing, Ariely and Levav (2000) hold portion size constant in their experiments by providing the same free 4 oz. sample glass of beer (study 2) or wine (study 3) to all participants and asking them to choose amongst flavors. We suggest that the choice options studied by Ariely and Levav (2000) differ on a nominal attribute (flavor), but are constant on ordinal attributes (e.g., portion size, price). Their finding that consumers avoid matching their co-consumers' beer selections provides support for our proposition that matching on nominal attributes is less important to consumers. In sum, these findings suggest that consumers sometimes avoid matching their co-consumers; we propose that this is commonly the case when products differ on a nominal attribute.

Table 1 summarizes these literatures showing matching and non-matching, illustrating

how our research builds on and extends prior findings (see also Web Appendix Tables B3 and B4). Importantly, whereas the prior work reviewed has focused on whether consumers adjust towards (i.e., match) others' food consumption decisions or not, our contribution centers on offering a broad perspective for predicting *what aspects* of a given choice are matched.

The Ordinal-Attribute Matching Effect

We use the ordinal-nominal distinction to predict that consumers match other consumers on ordinal but not nominal attributes. Specifically, we propose that ordinal attributes are more likely to set social norms for others to follow in a given situation. Drawing an analogy to the finding that first mover companies have an early entry advantage by setting the ideal attribute combination for “alignable” differences (Zhang and Markman 1998), we suggest that the individual who orders first can indicate which level of the (alignable) ordinal attribute is more socially comfortable or appropriate for a subsequent consumer. We next delineate how we expect the ordinal-nominal distinction to apply, first using food decision-making contexts, proposing (and confirming via pre-testing) that size, price, and brand prestige are exemplars of ordinal attributes and flavor and shape are exemplars of nominal attributes.

Portion size is an exemplar of an ordinal attribute in the consumption context, as portion sizes can easily be compared and ranked, such that one is bigger than the other. As to directionality—that is, which portion size (smaller or larger) is “better”—we propose that this may vary by context and consumers take cues from the co-consumer's choice in terms of what might be a more appropriate choice in a given situation. For example, if one's co-consumer first chooses a small portion size, they may be (perhaps only implicitly) suggesting that they view adherence to a health goal or avoiding overconsumption as more important. However, if one's co-consumer chooses a large portion size, they may be suggesting that enjoyment, indulgence, or

even value for one's money (e.g., considering the common usage of non-linear pricing; Dobson and Gerstner 2010; Haws and Winterich 2013) is better or more appropriate. Similarly, price and brand prestige are two other examples of ordinal attributes, which are easily compared and rankable. In choosing a cheaper or more expensive product (or a store vs. national brand), we suggest that the first consumer sets the signal of what is more appropriate. By choosing a cheaper alternative, the companion may be suggesting that being thrifty is better or more appropriate; by choosing a more expensive alternative, they may be suggesting that seeking quality (given price as a proxy for quality; Gneezy, Gneezy, and Lauga 2014; Huber and McCann 1982) is better or more appropriate. In sum, for an ordinal attribute, we suggest that the first co-consumer's choice sets a norm for what level of the attribute is most appropriate in the current context.

Flavor and shape are exemplars of nominal attributes. Flavor is a rather broad attribute in itself, but in general, we suggest this is a dimension that involves levels that are not objectively ranked, instead reflecting subjective personal preference (Gabszwick and Thisse 1986). We contend that, for example, whether a co-consumer chooses chocolate or vanilla does not affect which flavor is more normative or appropriate in that context, but rather is generally understood to be based on one's personal preferences. Similarly, whether a consumer selects penne or rotini pasta does not affect perceptions of what is normative. In other words, we suggest that occupying different positions on nominal attributes does not lend itself to objective ranking, and thus consumers need not match (and may even mismatch for various reasons) on these attributes.

We propose this ordinal-attribute matching effect by drawing on social comparison theory and social norms. We suggest that attributes perceived as ordinal, more so than nominal, increase the potential for social discomfort if consumers do not match. Thus, one underlying reason for ordinal matching should be the desire to avoid potential social discomfort associated

with *not* matching. This prediction arises from social comparison theory, which suggests that comparisons are pervasive (Festinger 1954) and both being out-performed and out-performing others can lead to discomfort for one or both parties (Argo, White, and Dahl 2006; Exline and Lobel 1999).

Central to our research, other people's choices and recommendations also signal (or create) social norms about beliefs, preferences, and the (normatively) "right" choice in the population or social context (Asch 1955; Burnkrant and Cousineau 1975; Cialdini 1985; Goldstein, Cialdini, and Griskevicius 2008). The information conveyed in these others' choices influences people to frequently conform to others' behaviors (Cialdini 1985; Goldstein, Cialdini, and Griskevicius 2008), presumably because a failure to do so causes social discomfort (Anderson and Dunning 2014; Asch 1955). Because ordinal attributes offer directly comparable levels that are easily ordered (e.g., choosing a larger vs. smaller portion size; spending more vs. less money), they more naturally facilitate social comparisons and set social norms. By contrast, nominal attributes do not offer directly comparable levels and thus are difficult to put into order, naturally mitigating social comparisons of being better or worse, and not setting norms that consumers feel they need to adhere to.

We note that our account does not necessarily predict a specific pattern for (mis)matching on nominal attributes, as we suggest nominal attributes are ones for which consumers can select their preferred option based on taste preferences (or perhaps a desire to explore various tastes in the case of undefined taste preferences). It is possible that on nominal attributes, either no evidence of matching, or in some circumstances, a mismatching pattern will occur as consumers choose options differing on nominal attributes for various reasons, which we elaborate on in the General Discussion. Our focal prediction, which we test next using multiple operationalizations,

is that consumers will match more on ordinal as opposed to nominal attributes. In our survey of managers, the influence of the ordinal/nominal distinction was not intuited: managers correctly predicted the ordinal effect, but on average over-estimated the nominal effect, predicting as much nominal matching as ordinal matching in some categories (Web Appendix A).

OVERVIEW OF STUDIES

A pilot study, nine main studies, and one supplemental study tested our conceptualization. Table 2 documents the conceptual definitions and operationalizations of ordinal and nominal attributes. Pre-testing confirmed that our operationalizations of ordinal and nominal attributes were consistent with participants' perceptions. The particular ordinal attribute levels used across studies were selected based on what we deemed to be reasonable levels for consumption in a single occasion (e.g., small vs. medium [not extra large] piece of cake; 1 vs. 2 [not 12] scoops of ice cream). A post-test ruled out the alternative explanation that consumers might always have weaker preferences for the ordinal attribute levels than the nominal attribute levels in our studies. Web Appendix C contains pre-test and post-test details.

The pilot study tested for initial field evidence for greater matching on an ordinal than a nominal attribute, using a correlational approach at a restaurant. The bulk of the remaining studies—Studies 1 to 5—utilized a variety of ordinal and nominal attributes to test for the basic effects (matching on ordinal; not matching on nominal) and to generalize the findings to multiple contexts with clear managerial implications. Study 6 then provided further evidence for our matching theory by testing whether framing an attribute as being more ordinal versus nominal affects the extent of matching. Finally, studies 7-8 and a supplemental study described in full in Web Appendix F tested for minimizing the social discomfort of one or both parties as one reason for the ordinal matching effect. Table 3 presents a summary of the findings for these 11 studies.

[Insert Tables 2 and 3 about here]

PILOT STUDY WITH RESTAURANT DATA

We used secondary data to test for initial evidence for matching on an ordinal attribute more than a nominal attribute. The ordinal attribute was operationalized as food healthiness and the nominal attribute as food flavor.

Method

Data were collected during dinner at a Vietnamese restaurant in the U.S. by a separate research team, which provided the data for the two relevant questions to us. Research assistants asked each adult diner to participate at the end of their meals, immediately before receiving their checks from the waiter. Diners were provided with a \$3 check discount if they agreed to participate. Of 158 diners asked, 152 agreed to participate ($M_{\text{age}} = 28.61$ years, 87 females, 62 males, $n = 3$ unreported), and 140 ($M_{\text{age}} = 28.55$ years, 81 females, 57 males, $n = 2$ unreported) completed both questions relevant to our research, as participants eating alone were asked to skip these questions. The two questions asked about perceived similarity in healthiness (ordinal attribute) and flavor (nominal attribute) with their companion(s)' food: "How similar in terms of healthiness was the food that the other person(s) you were with ate compared to what you ate?" (1 = *very different in terms of healthiness*, 7 = *very similar in terms of healthiness*) and "How similar in terms of flavor was the food that the other person(s) you were with ate compared to what you ate?" (1 = *very different in terms of flavor*, 7 = *very similar in terms of flavor*).

Results and Discussion

A paired t -test showed that participants perceived more similarity with their companion(s) on healthiness than on flavor ($M_{\text{healthiness_similarity}} = 5.51$, $M_{\text{flavor_similarity}} = 4.69$, $t(139) = 5.60$, $p < .001$), providing initial evidence that consumers dining together exhibit greater

similarity on an ordinal attribute than a nominal attribute in consequential choice. Of course, there are limitations to this data, including the lack of causal evidence as we do not know who ordered first and the use of consumers' perceptions of similarity. The remaining studies address these issues using controlled experiments.

STUDY 1: REAL CHOICES - PORTION SIZE AS ORDINAL & FLAVOR AS NOMINAL

Study 1 tested the basic effect (matching on ordinal, but not nominal attributes) using a controlled experiment with food portion size as the ordinal attribute and food flavor as the nominal attribute. We studied real food choices as participants received their selected cake.

Method

This study had a 2 (partner's portion size: small, medium) \times 2 (partner's flavor: chocolate, vanilla) between-subjects design. Participants ($N = 186$; $M_{\text{age}} = 20.19$; 83 females, 102 males, 1 other) were undergraduates who received course credit for participating in a multi-participant lab session. Participants were informed that they would be paired with another participant to watch a movie clip together while each having a snack (a slice of cake) and chatting. Participants provided information about themselves (age, gender, current school affiliation) and were then shown a cake menu with four options: small chocolate, medium chocolate, small vanilla, and medium vanilla (Web Appendix D contains all stimuli). We chose the small and medium labels, given potential aversion to the "large" portion size label (Aydinoğlu and Krishna 2011), especially among undergraduates. Before making their cake slice choice, participants were provided with a profile of their same-gender chat partner. Importantly, the partner's snack choice was also depicted, and we varied this based on each participant's randomly assigned condition. Each participant then chose a slice of cake for themselves from the menu which they received in a closed container at the end of the session. We then measured

individual differences in need for uniqueness ($\alpha = .92$) (Tian, Bearden, and Hunter 2001). There was no main effect or interaction of need for uniqueness on either portion size or flavor choice (all $ps > .20$), suggesting that this effect does not involve an identity-signaling process (Berger and Heath 2007; Chan, Berger, and Van Boven 2012), and thus we do not mention it further. Finally, participants were informed at the end of the study that the movie and chat would not take place given time constraints but importantly, they already made their choice.

Results and Discussion

The first analysis approach we use in study 1 and also 2a-2b, 4-5, and 8—which share the same main design—is to examine if the partner’s ordinal selection has a significant positive (i.e., matching) effect on the participant’s ordinal selection and second if the partner’s nominal selection has a significant positive (i.e., matching) effect on the participant’s nominal selection. We predict that the answer is yes to the first question and no to the second. Note that the participant’s choice among four options in this study (and 2a-2b, 4-5, and 8) is first coded into a binary dependent variable (DV) for portion size choice and another binary DV for flavor choice. As these are two different DVs coded from each participant, two separate binary logistic regressions test these effects separately. To directly compare ordinal matching to nominal matching, we then coded participants into groups based on whether they match or mismatch their partner on the ordinal and nominal attributes and conducted exact binomial tests comparing the relative proportions of ordinal-only and nominal-only matching (see Table 4).

Figure 1 shows the choice shares by condition. As predicted, participants matched their partner on size but not flavor. First, for the ordinal attribute of portion size, there was a significant positive effect, indicating matching (i.e., 63.4% chose medium in the partner chose medium conditions vs. 30.1% chose medium in the partner chose small conditions; $B = 1.39$ (SE

= .31), Wald $\chi^2(1) = 19.92, p < .001$). Second, for the nominal attribute of flavor, there was no significant effect, indicating no evidence of matching (56.6% chose chocolate in the partner chose chocolate conditions vs. 53.6% chose chocolate in the partner chose vanilla conditions; $B = .17$ (SE = .30), Wald $\chi^2(1) = .33, p = .568$). There were no interactions between the partner's portion size and the partner's flavor on the participant's size choice (Wald $\chi^2(1) = .27, p = .603$) or flavor choice (Wald $\chi^2(1) = .20, p = .657$).

[Insert Figure 1 about here]

Another way to depict and analyze choices is shown in Table 4, in which we coded all participants into four groups based on whether they matched or mismatched their partner on the ordinal or nominal attribute. Using these matches, we conducted exact binomial tests for ordinal and nominal matching, which show a significant matching effect for the ordinal attribute (124 matched vs. 62 did not match on the ordinal attribute, $p < .001$), but not the nominal attribute (97 matched vs. 89 did not match on the nominal attribute, $p = .304$).

We also used a similar binomial test to directly compare the proportion of ordinal-only matching and the proportion of nominal-only matching, showing that the extent of matching for the ordinal attribute is greater than for the nominal attribute ($p = .006$). Importantly, for both this study and all other studies sharing this same core experimental design, both the binary logistic regression approach and the exact binomial approach lead to the same conclusions for ordinal matching and for nominal matching; thus, we only briefly mention the exact binomial approach comparing ordinal-only versus nominal-only matching in the results of the other studies (Table 4 contains all exact binomial tests for the relevant studies—1, 2a-2b, 4, 5, 8).

[Insert Table 4 about here]

In sum, study 1 showed consequential choice evidence for the ordinal-attribute matching

effect: consumers matched a partner's portion size but not flavor selection.

STUDIES 2A-2B: GENERALIZING TO VARIOUS ORDINAL & NOMINAL ATTRIBUTES

Studies 2a-2b generalize our findings to two other products (dried pasta, wine) with different operationalizations of ordinal (brand prestige, price) and nominal (shapes, earthy vs. fruity flavor) attributes. Generalizing provides a broader theory test and addresses alternative explanations that might explain study 1, but cannot account for findings in other studies. For instance, study 2a tests our conceptualization with a much less hedonic product category, dried pasta, for which licensing is unlikely to be driving any effects but for which we still expect to observe matching on the ordinal attribute more than the nominal attribute.

Additionally, studies 2a-2b each include a no information control condition, in which the other person's order was left unspecified, to explore in which direction movement occurred relative to consumers' preferences in the absence of knowing the other's choice. Table 5 summarizes the control conditions across studies, including results of statistical comparisons of each condition to the control condition (see Web Appendix E for details).

Study 2a

Method. Study 2a had a 2 (friend's brand: lower-end store brand, higher-end national brand) \times 2 (friend's pasta shape: penne, spaghetti) + 1 (control: friend's choice not specified) between-subjects design. Participants ($N = 422$; $M_{age} = 35.88$ [12 did not report age]; 195 females, 214 males, 1 other; 12 did not report gender) from Amazon Mechanical Turk (MTurk) provided a same-gender friend's name and imagined arriving at Walmart to shop for groceries. Participants imagined reaching the pasta aisle and seeing four options on the endcap display: Barilla (national brand) penne, Barilla spaghetti, Great Value (store brand) penne, and Great Value spaghetti. Based on randomly-assigned condition, participants were told that their friend

selected one of these four options, or no such information was provided. Participants then chose an option for themselves.

Results and discussion. Focusing first on the main design, excluding the no information control, analyses support our predictions. For the ordinal brand prestige attribute, there was a significant positive effect, indicating matching (i.e., 51.2% chose the national brand in the friend chose national brand conditions vs. 39.3% chose the national brand in the friend chose store brand conditions; $B = .48$ ($SE = .22$), Wald $\chi^2(1) = 4.78$, $p = .029$). By contrast, there was no significant effect for the nominal shape attribute, indicating no evidence of matching (i.e., 48.2% chose the penne shape in the friend chose penne conditions vs. 48.2% chose the penne shape in the friend chose spaghetti conditions; $B = -.002$ ($SE = .22$), Wald $\chi^2(1) < .001$, $p = .994$). Again, there were no interactions between the friend's brand prestige and the friend's shape on the participant's brand prestige (Wald $\chi^2(1) = .003$, $p = .958$) or shape (Wald $\chi^2(1) = .43$, $p = .511$). Figure 2a shows choice shares by condition. Additionally, the binomial test (see Table 3) comparing the proportions of ordinal and nominal matching confirmed that the extent of matching for the ordinal attribute was greater than for the nominal attribute ($p = .002$).

[Insert Figures 2a-2b about here]

To begin exploring directionality for the ordinal-matching effect, we also examined the no information control condition to explore where the movement was relative to consumers' preferences in the absence of knowing their friend's choice. Specifically, we compared the percentage choosing the national brand (vs. the store brand) across the no information control, friend chooses national brand, and friend chooses store brand conditions (collapsing across the friend's shape in the latter two non-control cases). Choice in the no information control condition (58.1% chose the national brand) was significantly different from choice in the friend chooses

store brand condition (39.3% chose the national brand), Wald $\chi^2(1) = 8.02, p = .005$, and not significantly different from choice in the friend chooses national brand condition (51.2% chose the national brand), Wald $\chi^2(1) = 1.10, p = .294$. Thus, matching on the ordinal attribute (brand prestige) appears to be driven primarily by more participants selecting the lower-end store brand when aware that their friend has done so. Table 5 contains details on the no information control condition for this study and the others that include a no information control. As no consistent pattern emerged across study contexts, we discuss the control condition results summarized across studies in the General Discussion.

[Insert Table 5 about here]

Study 2b

Method. Study 2b had a 2 (friend's price: low, high) \times 2 (friend's flavor: fruity, earthy) + 1 (control: friend's order not specified) between-subjects design. Participants ($N = 315$; $M_{\text{age}} = 37.14$ [4 did not report age]; 158 females, 151 males, 2 other, 4 did not report gender) from MTurk first provided a same-gender friend's name and imagined arriving at a wine bar with their friend. Participants viewed a menu with four wine-by-the-glass options: Grenache–fruit-flavored (\$4), Malbec–fruit-flavored (\$8), Syrah–earthy-flavored (\$4), and Chianti–earthy-flavored (\$8). We specified that wines were served by the glass, so portion size was held constant. Based on randomly-assigned condition, participants were told that their friend ordered one of these four options, or no such information was provided. Participants then chose an option for themselves.

Results and discussion. Focusing on the main design (excluding the no information control), study 2b's results largely replicated those of studies 1 and 2a. For the ordinal attribute of price, there was a significant positive effect, indicating matching (i.e., 40.9% chose a higher-priced glass of wine in the friend chose higher-priced glass conditions vs. 24.8% chose a higher-

priced glass of wine in the friend chose lower-priced glass conditions; $B = .74$ ($SE = .27$), Wald $\chi^2(1) = 7.32$, $p = .007$). However, for the nominal attribute of flavor, there was a marginally significant negative effect (i.e., 60.0% chose the fruity flavor in the friend chose fruity conditions vs. 71.7% chose the fruity flavor in the friend chose earthy conditions; $B = -.52$ ($SE = .27$), Wald $\chi^2(1) = 3.78$, $p = .052$), reflecting some mismatching. Again, there were no interactions between the friend's price and the friend's flavor on the participant's price choice (Wald $\chi^2(1) = .10$, $p = .758$) or flavor choice (Wald $\chi^2(1) = .90$, $p = .342$). Figure 2b shows choice shares by condition. Additionally, the binomial test (see Table 4) comparing the proportion of ordinal and nominal matching showed that the extent of matching for the ordinal attribute was marginally significantly greater than for the nominal attribute ($p = .075$).

In sum, studies 2a and 2b replicated study 1's ordinal matching effect, but with different operationalizations of ordinal and nominal attributes. Interestingly, study 2b also found directional mismatching on the nominal attribute, perhaps because we examined more novel flavors in study 2b (fruity vs. earthy), which might be more analogous to those studied by Ariely and Levav (2000) in their beer studies showing mismatching. Importantly, the findings thus far support our theory that consumers match on the basis of ordinal attributes, rather than nominal ones, and also address alternative explanations that only apply to one set of attribute operationalizations.

STUDY 3: INFORMATION ABOUT COMPANION'S SELECTION ON ONE ATTRIBUTE

In studies 1-2b, participants were provided with information about another's selection on *both* the ordinal and nominal attributes. Thus, research extending optimal distinctiveness theory (Brewer 1991) might suggest an alternative explanation: that for a two-attribute product for which people are aware of a co-consumer's standing on both attributes, people may match on

just one of the two attributes in order to show an optimal level of distinction (Chan, Berger, and Van Boven 2012). Our account, however, is that matching is dependent on the underlying nature of the attributes themselves. Accordingly, our ordinal-attribute matching effect should hold even when consumers only have information about their friend's selection on one attribute (ordinal or nominal). Thus, study 3 presents participants with information about their friend's selection on only one attribute (ordinal or nominal).

Method

Participants ($N = 378$; $M_{\text{age}} = 37.29$ [11 did not report age]; 201 females, 165 males, 1 other, 11 did not report gender) from MTurk completed this study. This study had a 2 (ordinal information: small portion size, large portion size) + 2 (nominal information: chocolate flavor, vanilla flavor) + 1 (control: friend's order not specified) between-subjects design. Thus, differing from studies 1-2b, participants in the main design received only one piece of information about their friend's order (they received *either* ordinal or nominal information, not both). Accordingly, all participants provided a same-gender friend's name and imagined arriving at an ice creamery together and viewing a four-option menu: 1 scoop chocolate, 2 scoops chocolate, 1 scoop vanilla, and 2 scoops vanilla. Then, based on random assignment, participants were told their friend ordered "1 scoop of ice cream" (ordinal information condition, small portion size), "2 scoops of ice cream" (ordinal information condition, large portion size), "chocolate ice cream" (nominal information condition, chocolate flavor), "vanilla ice cream" (nominal information condition, vanilla flavor), or were not given any information (no information control condition).

Participants then chose an option for themselves from the four-option menu. Finally, we again measured need for uniqueness ($\alpha = .92$; completed by 368 participants). As in study 1, there was no main effect or interaction of need for uniqueness on either portion size choice or flavor choice

(all $ps > .20$) and thus we do not mention it further.

Results and Discussion

Figure 3 shows choice shares by condition. As predicted, examining the two ordinal-information conditions, there was a significant positive effect of the friend's size choice, indicating matching (i.e., 61.8% chose large in the friend chose large condition vs. 42.1% chose large in the friend chose small condition; $B = .80$ (SE = .33), Wald $\chi^2(1) = 5.85$, $p = .016$). In contrast, examining the two nominal-information conditions, there was no effect of the friend's flavor choice, indicating no evidence of matching (i.e., 49.3% chose chocolate in the friend chose chocolate condition vs. 57.9% chose chocolate in the friend chose vanilla condition; $B = -.35$ (SE = .33), Wald $\chi^2(1) = 1.11$, $p = .292$).

[Insert Figure 3 about here]

Given the different design (participants received information about *either* ordinal or nominal standing, not both), we also compared the percentage of matchers as a function of attribute information condition. As predicted, the percentage of participants choosing to match in the ordinal-information conditions (friend's order information = small or large portion size) was significantly greater than in the nominal-information conditions (friend's order information = chocolate or vanilla flavor) (59.9% matched in the ordinal-information conditions vs. 45.7% matched in the nominal-information conditions; Wald $\chi^2(1) = 6.06$, $p = .014$).

In sum, study 3 supports our account that matching on ordinal (more than nominal) attributes is dependent on the properties of the attributes themselves, rather than reflecting a desire to match optimally on only one attribute when information about both is provided.

STUDY 4: REAL FINANCIAL CHOICES IN A DONATION CONTEXT

Study 4 further generalizes our theoretical account by extending beyond the food domain

to the prosocial domain, in which we operationalize the ordinal attribute in terms of donation amount and the nominal attribute in terms of donation cause. This provides both a broader test of our theory and additional practical implications for managers.

Method

Study 4 had a 2 (partner's donation amount: 0.25, \$0.50) \times 2 (partner's donation cause: polar bears, elephants) + 1 (control: partner's donation not specified) between-subjects design. Participants ($N = 409$; $M_{\text{age}} = 36.70$; 201 females, 208 males) from MTurk completed this study; they were informed upon sign-up that they would receive a base payment and could receive additional money depending on a choice they made in the study. All participants provided their initials and were informed that they would take part in "A Virtual Zoo Experience and Chat with another Amazon Mechanical Turk Worker." After a 25-second delay during which we ostensibly paired them with another MTurk worker, participants read:

You, [participant's initials], have been paired with another Amazon Mechanical Turk worker, J.L., to participate in this virtual zoo experience and chat study together. We would like to have you look at a video containing a series of images from a zoo with your partner, J.L. More and more zoos are providing the opportunity to "visit" them virtually (e.g., by providing videos of their animals). You will both look at one example of this type of video and then answer some questions about the video and chat briefly about it afterwards.

Consistent with the task description, participants then watched a video with images of zoo animals, including polar bears and elephants.

Each participant was then given a 50-cent bonus and instructed to make a donation choice with it. Participants were told that their partner was randomly selected to make their choice first and that after their partner decided, they would receive information about their partner's donation. Participants were told that they would then decide how much of their 50 cents to donate and to which cause (polar bears or elephants). Importantly, they were told "you will get to keep remaining money if there is any" and "based on your donation decision, we will actually

donate the amount of mTurk bonus you specify to a polar bear charity (polarbearsinternational.org) or an elephant charity (savetheelephants.org).” Both statements were true, making this an incentive-compatible choice with real (modest) financial implications.

After a brief delay while their partners ostensibly made donation decisions, participants were shown what their partner donated, based on condition (25 cents to polar bears, 25 cents to elephants, 50 cents to polar bears, 50 cents to elephants; donation information unspecified in the control condition, in which participants were only told that their partner finished making a donation). All participants then made a choice from the same set of donation options with the option to not donate anything to capture real-life donation opportunities that people can easily turn down. Participants received any remainder of their \$0.50 that they did not donate. Finally, participants were informed that the chat with the partner would not occur given time constraints; donations were made to the charities on participants’ behalf by the researchers after the study.

Results and Discussion

Participants who opted not to donate ($n = 115$ out of 409) were necessarily excluded to facilitate our analysis (a binary outcome). Importantly, the percentage of participants who chose not to donate did not differ across the five conditions ($M = 28.1\%$; $\chi^2(4) = 3.02$, $p = .555$).

Focusing on the main design (excluding the no information control), as predicted, participants matched their partner on donation amount but not donation cause. Specifically, for the ordinal donation amount attribute, there was a significant positive effect, indicating matching (i.e., 52.5% donated \$0.50 in the partner donated \$0.50 conditions vs. 22.3% donated \$0.50 in the partner donated \$0.25 conditions; $B = 1.35$ ($SE = .29$), Wald $\chi^2(1) = 21.28$, $p < .001$). By contrast, for the nominal donation cause attribute, there was a significant negative effect, indicating mismatching (i.e., 47.3% donated to polar bears in the partner donated to polar bear

cause conditions vs. 71.2% donated to polar bears in the partner donated to elephant cause conditions; $B = -1.01$ ($SE = .28$), Wald $\chi^2(1) = 13.27$, $p < .001$). There were no interactions between the partner's donation amount and the partner's donation cause on the participant's donation amount (Wald $\chi^2(1) = .12$, $p = .724$) or donation cause (Wald $\chi^2(1) = .10$, $p = .754$). Additionally, the binomial test (Table 4) comparing the proportion of ordinal and nominal matching confirmed more matching for the ordinal attribute than the nominal attribute ($p < .001$).

[Insert Figure 4 about here]

Study 4 generalized our theory to a very different domain with managerial and policy implications—donations. Importantly, we observed ordinal matching and did not observe nominal matching. In fact, we observed nominal mismatching—suggesting (perhaps) a desire to ensure that both valid “good causes” receive financial support.

STUDY 5: EMPLOYEE-CUSTOMER INTERACTIONS WITH REAL PURCHASES

Study 5 shifts to examining employee-consumer interactions, both to increase managerial relevance and to further generalize our findings. In this study, the other person who first provided information about their order was a store employee, rather than a fellow consumer, offering clear managerial implications as managers can direct their employees' actions and communications.

Method

Study 5 had a 2 (employee's brand: lower-end store brand, higher-end national brand) \times 2 (employee's flavor: chocolate, peanut butter) between-subjects design. Participants ($N = 162$; $M_{age} = 20.26$ [1 unreported]; 69 females, 92 males, 1 unreported) were undergraduates who received course credit. Participants began in a university business research center's privacy-partitioned computer lab. The computers displayed instructions that participants would evaluate

the center's new retail store space, and each participant was provided with an envelope containing four quarters (\$1.00) at their station. They were informed that this was their money to use to buy one granola bar from the center's new store located next door (they were informed that any money left over was theirs to keep). See Web Appendix D for participant instructions.

Study timing was staggered such that a lab administrator directed each participant one at a time to bring their money with them to a store containing shelves stocked with various products (paper goods, water bottles, t-shirts, cereal, gift boxes) and most importantly, a check-out table with a cash register and a display of four different granola bar options priced as follows to be more consistent with actual price differences between the brands: Quaker (national) brand chocolate chip granola bar [\$0.75], Quaker (national) brand peanut butter granola bar [\$0.75], Great Value (store) brand chocolate chip granola bar [\$0.50], and Great Value (store) brand peanut butter granola bar [\$0.50]. See Web Appendix D for store photos. A store employee (blind to hypotheses) was stationed behind the check-out table and based on condition (rotated hourly across five days; see schedule in Web Appendix D), said:

“Hi, we'd like to test out the store today to get your impressions, so we're letting you purchase a granola bar. Here are the four granola bar options we have. I tried testing the store out too earlier today, and I bought the [based on condition: Great Value peanut butter granola bar, Great Value chocolate chip granola bar, Quaker peanut butter granola bar, Quaker chocolate chip granola bar]. Go ahead and choose which bar to purchase, and I'll put it in a bag for you.”

Participants then made their purchase and the employee put the granola bar into a brown paper bag to ensure that other participants would not see their selection. Next, participants returned to their computer stations with their granola bar and leftover money, which they got to keep. Participants reported their granola bar selections, which were cross-checked with recorded inventory levels to ensure accurate reporting. Participants also completed managerially-relevant measures indicating their purchase satisfaction (“How satisfied are you with your purchase?”

from 1 = *not at all satisfied* to 7 = *very satisfied*), experience enjoyment (“How much did you enjoy your experience at the store?” from 1 = *not at all* to 7 = *very much*), and liking of the store keeper (“Overall, how would you rate the store keeper?” from 1 = *I disliked the store keeper very much* to 7 = *I liked the store keeper very much*).

Results and Discussion

Figure 5 shows choice shares by condition. Participants matched the employee on brand prestige but not on flavor. There was a significant positive effect of the employee’s brand choice on the participant’s brand choice, indicating matching on the ordinal brand attribute (i.e., 65.2% chose the national brand in the employee chose national brand conditions vs. 43.8% chose the national brand in the employee chose store brand conditions; $B = .87$ (SE = .32), Wald $\chi^2(1) = 7.27$, $p = .007$). By contrast, there was no significant effect of the employee’s flavor choice on the participant’s flavor choice, indicating no evidence of matching on the nominal flavor attribute (i.e., 50.6% chose chocolate chip in the employee chose chocolate chip conditions vs. 49.4% chose chocolate chip in the employee chose peanut butter conditions; $B = .05$ (SE = .31), Wald $\chi^2(1) = .02$, $p = .875$). There were no significant interactions between the employee’s brand prestige and the employee’s flavor on the participant’s brand prestige (Wald $\chi^2(1) = 2.61$, $p = .106$) or flavor (Wald $\chi^2(1) = .93$, $p = .334$). Additionally, the binomial test (see Table 4) comparing the proportion of ordinal and nominal matching confirmed that the extent of matching for the ordinal attribute was greater than for the nominal attribute ($p = .050$).

[Insert Figure 5 about here]

We also examined purchase satisfaction, experience enjoyment, and store keeper evaluation (all on 7-point scales). Overall means were high for all three measures (purchase satisfaction: $M = 5.58$, $SD = 1.19$; experience enjoyment: $M = 5.28$, $SD = 1.11$; store keeper

evaluation: $M = 6.08$, $SD = .95$), and there were no main effects or interactions of the employee's brand choice and the employee's flavor choice on these measures.

In sum, study 5 demonstrated real purchase choice evidence for the ordinal-attribute matching effect. Further, the purchase satisfaction, experience evaluation, and employee evaluation measures indicate that even when an employee is suggesting a product that costs more, consumers do not appear to get upset with the store or its employees (i.e., no evidence of backfire effects with consumers feeling reactant about being persuaded towards a more expensive product). There does not seem to be a managerial cost to employees providing information about their own selections, but there is a clear upside.

STUDY 6: FRAMING AN ATTRIBUTE AS ORDINAL VERSUS NOMINAL

Study 6 aims to provide further theory evidence and additional managerial implications by testing whether framing an attribute as more ordinal (i.e., with the attribute having instrumental value and thus being ranked) versus nominal (i.e., with the attribute not having instrumental value and thus not being ranked) affects matching tendencies. This study offers an additional theory test because: (1) if it is the ordinal versus nominal distinction driving the effect, then framing an attribute as such should produce a pattern consistent with our conceptualization, and (2) if it is indeed perceptions of an attribute's nominal/ordinal-ness driving the effect—rather than something inherent or unmeasured differences in the attributes—then framing an attribute as such should work but not otherwise. Finally, this study also addresses potential concerns with the particular attribute levels chosen by keeping the attribute levels the same for all participants and framing whether the attribute is ordinal or nominal.

Method

This study had a 2 (attribute framing: ordinal, nominal) group between-subjects design.

We included two stimulus replicates, as participants either were informed that their friend's pasta shape was orecchiette or pappardelle. Participants ($N = 207$; $M_{\text{age}} = 39.15$ [4 did not provide age]; 100 females, 103 males, 4 did not provide gender) were recruited from MTurk. They first provided a same-gender friend's name. They then imagined being on a shopping trip to buy ingredients for their family's weekly Sunday dinner and that their friend also needed to buy some things for their own family, so they went shopping together. They imagined arriving at Williams-Sonoma to buy dried pasta and arriving at the pasta section where they viewed a display featuring two kinds of pasta, with different shapes: orecchiette and pappardelle. See Web Appendix D for images of the two pastas. Participants were then shown a sign at the top of the pasta display, which varied based on random assignment. In the ordinal condition, participants saw a sign that said, "Pasta designers purposely design pasta shapes which hold the sauce better and keep the pasta firmer even if it was cooked for too long. Some pasta shapes are thus better than others!" In the nominal condition, participants saw a sign that said, "Pasta designers purposely design pasta shapes to have different appearances. Some pastas thus have a different shape than others, but not necessarily any better or worse!" See Web Appendix D for the two signs. Based on random assignment, participants were then told that their friend chose the orecchiette pasta or the pappardelle pasta. Participants then chose a pasta for themselves. Thus, we coded the key dependent variable representing matching or mismatching (coded 1 = matching, 0 = mismatching) by combining the friend's shape choice (IV) with the participant's shape choice (DV) to code each participant as having matched or not matched.

Results and Discussion

A 2 (attribute framing: ordinal, nominal) group binary logistic regression on the matching binary outcome showed a significant effect, $B = .76$ ($SE = .28$), Wald $\chi^2(1) = 7.27$, $p = .007$,

such that more participants matched in the ordinal framing condition (58.7%) than in the nominal framing condition (39.8%). The degree of matching did not differ as a function of whether the friend chose orecchiette or pappardelle (i.e., there was no interaction between framing condition and the friend's choice on matching, $p = .946$). See Figure 6.

[Insert Figure 6 about here]

Overall, study 6 showed that framing the same attribute as offering instrumental value (which we suggest is a conceptual antecedent for ordinality) versus not offering such instrumental value significantly increases matching. This finding thus provides further evidence for our theory, as ordinal (vs. nominal) framing increases matching. Practically, study 6 also suggests that external marketing cues (signage) can be used to frame attributes and thus influence the direction of social influence effects.

STUDY 7: ATTRIBUTE MIS(MATCHING) AND SOCIAL CONSEQUENCES

The final two studies use a multi-method approach to examine minimizing social discomfort as one reason for ordinal matching. Study 7 tests the relationship between attribute mis(matching) and beliefs about perceived social discomfort for both parties.

Method

Participants ($N = 198$; $M_{\text{age}} = 35.65$; 84 females, 114 males) recruited from MTurk completed this study, which had a 2 (size-matching: yes, no) \times 2 (flavor-matching: yes, no) between-subjects design. Participants provided a same-gender friend's name and imagined arriving at an ice creamery with their friend. Participants viewed the same four-option menu as in study 3 (1 scoop chocolate, 2 scoops chocolate, 1 scoop vanilla, 2 scoops vanilla). Participants were told that their friend placed their order but the friend's order was purposely left unspecified in all conditions. Instead, based on random assignment, participants then imagined ordering

either the same or different size or flavor of ice cream as their friend. For instance, in the size-matching and flavor-matching condition, participants read, “Imagine that you order the same size and the same flavor of ice cream as your friend.”

Participants then responded to eight statements in random order, indicating to what extent they thought their choice would have various negative or positive social consequences (1 = *not at all* to 7 = *very much so*). Web Appendix B (Table B5) contains the wording for all eight statements. Statements i-v emphasized negative outcomes, and statements vi-viii emphasized positive outcomes. We included both negative and positive statements to explore if anticipating negative social consequences of mismatching on an ordinal attribute or anticipating positive social consequences of matching on an ordinal attribute appeared stronger and more consistent, but we expected them to capture the same basic underlying construct of social discomfort. Finally, participants indicated which ice cream option they would have selected, so that we could explore if there were differences based on participants’ underlying preferences.

Results and Discussion

A factor analysis revealed two factors: (i-v) negative consequences (5 items; $\alpha = .91$) and (vi-viii) positive consequences (3 items; $\alpha = .68$). We thus averaged responses to create two index measures for our main analysis and conducted a 2 (size-matching: yes, no) \times 2 (flavor-matching: yes, no) ANOVA on each index. For the negative consequences index, there was no main effect of flavor-matching ($F(1, 194) = .89, p = .348$), a significant main effect of size-matching such that participants anticipated that their choice would have more negative consequences if they mismatched versus matched on size ($M = 1.85$ vs. $M = 1.46$; $F(1, 194) = 8.05, p = .005$), and no interaction ($F(1, 194) = .09, p = .766$). For the positive consequences index, there was no main effect of flavor-matching ($F(1, 194) = 1.72, p = .191$), a significant

main effect of size-matching such that participants anticipated that their choice would have more positive consequences if they matched versus mismatched on size ($M = 3.73$ vs. $M = 3.25$; $F(1, 194) = 6.68, p = .010$), and no interaction ($F(1, 194) = .01, p = .911$). We also conducted an item-specific analysis for completeness (see Web Appendix B, Table B5). As expected given the high reliability of the negative consequences index, the negative consequence items all had similar findings (i.e., only a significant main effect of size-matching on negative consequences). The positive consequence items showed greater variability in statistical significance across items, though the results were generally in line with the overall pattern of a size-matching effect whereby people believe matching on size will lead to more positive consequences. Finally, given that participants also indicated which option they would have selected, we explored whether the social discomfort effects differed based on participants' underlying preferences. We did not find conclusive evidence that one direction clearly shaped the effects (i.e., whether self orders small and other orders large or vice versa; see Web Appendix E).

In sum, study 7 demonstrated that consumers anticipate both negative consequences of mismatching and some positive consequences of matching, but the anticipation of negative consequences of mismatching appears to be the stronger result. These findings are consistent with work showing that negative emotions and the prospect of negative consequences weigh more heavily on people than positive ones (Fiske 1980; Herr, Kardes, and Kim 1991; Kahneman and Tversky 1979; Skowronski and Carlston 1987). In a related supplemental study (study S2 in Web Appendix F), we confirmed that consumers perceive social discomfort to be higher from ordinal mismatching than nominal mismatching, conceptually replicating study 7 with a wider range of stimuli and operationalizations of ordinal and nominal attributes. Additionally, Web Appendix F contains a brief discussion of why the overall levels of negative social consequences

were likely generally low, but not unexpectedly so.

STUDY 8: MATCHING TO MITIGATE NEGATIVE SOCIAL CONSEQUENCES

Study 8 tests whether consumers who matched (vs. mismatched) on ordinal attributes are more likely to report that minimizing social discomfort was a choice driver. We used a design more similar to our prior studies (1, 2a-2b, 4, 5), and because study 7 showed stronger results for the negative social consequences, we focused on negative social consequences with one self-focused item (i) and one other-focused item (ii), consistent with Exline and Lobel (1999)'s theorizing that concern about how others might respond to social comparison can be centered on consequences for one or both parties.

Method

Participants ($N = 190$; $M_{\text{age}} = 19.69$ [2 participants did not report age]; 95 females, 94 males, 1 participant did not report gender) were undergraduate students who received course credit. This study had a 2 (friend's portion size: small, large) \times 2 (friend's flavor: chocolate, vanilla) between-subjects design. Participants provided a same-gender friend's name and imagined arriving at an ice creamery together and viewing a four-option menu: 1 scoop chocolate, 2 scoops chocolate, 1 scoop vanilla, and 2 scoops vanilla. Based on randomization, participants were told that their friend ordered one of these four options and then chose an option for themselves. Finally, participants reported if mitigating social discomfort was a choice driver: "Thinking about your ice cream order...to what extent were you trying to make an ice cream choice that..." : (i) "would not make your friend think poorly of you" and (ii) "would not make your friend feel uncomfortable" (1 = *not at all* to 7 = *very much so*; order of statements randomized; responses averaged for a social discomfort mitigation index: $r = .82$, $p < .001$).

Results and Discussion

First, replicating our key effects, participants matched their friend on size but not flavor (Figure 7). There was a significant positive effect of friend's size on participant's size, indicating matching on the ordinal size attribute (66.7% chose large in the friend chose large conditions vs. 22.3% chose large in the friend chose small conditions; $B = 1.94$ ($SE = .33$), Wald $\chi^2(1) = 34.75$, $p < .001$). There was no effect of friend's flavor on participant's flavor, indicating no matching on the nominal flavor attribute (46.3% chose chocolate in the friend chose chocolate conditions vs. 45.3% chose chocolate in the friend chose vanilla conditions; $B = .04$ ($SE = .29$), Wald $\chi^2(1) = .02$, $p = .884$). There were no interactions between the friend's portion size and the friend's flavor on the participant's portion size choice (Wald $\chi^2(1) = 1.09$, $p = .297$) or flavor choice (Wald $\chi^2(1) = .02$, $p = .886$). Additionally, the binomial test (see Table 4) comparing the proportion of ordinal and nominal matching confirmed that the extent of matching for the ordinal attribute was greater than for the nominal attribute ($p < .001$).

[Insert Figure 7 about here]

To examine the proposed social discomfort process, we then compared whether participants who matched versus mismatched on the ordinal attribute (Table 4) differed in reporting social discomfort mitigation as a choice driver. As predicted, participants who matched on size reported that mitigating social discomfort was more of a choice driver than participants who mismatched on size ($M_{\text{ordinal-matchers}} = 1.82$ vs. $M_{\text{ordinal-mismatchers}} = 1.35$; $t(188) = 2.18$, $p = .031$). We explored if these results differed between participants who chose small versus large and did not find this to be the case (see Web Appendix E). We also compared participants who matched versus mismatched on the nominal flavor attribute (Table 4): there was no difference between these groups in reporting that mitigating social discomfort was a choice driver ($M_{\text{nominal-matchers}} = 1.61$ vs. $M_{\text{nominal-mismatchers}} = 1.76$; $t(188) = -.75$, $p = .456$). There was also no interaction

between size-matching and flavor-matching on reporting mitigating social discomfort as a choice driver ($F(1, 186) = .02, p = .896$). We note that we do not test for mediation using more typical approaches (i.e., friend's size choice \rightarrow reporting mitigating social discomfort as a choice driver \rightarrow participant's size choice) because participants were asked if mitigating social discomfort was a choice driver. Thus, ordinal matchers (vs. mismatchers) should, and do, differ on this measure, whereas we did not expect that being told that their friend has selected a large size (vs. a small size) would lead to participants reporting that social consequences was a driver of their choice (indeed, there was no difference: $M_{\text{friendorderslarge}} = 1.64$ vs. $M_{\text{friendorderssmall}} = 1.73$; $t(188) = -.48, p = .633$).

In sum, study 8 showed that participants who chose to ordinally match reported that avoiding social discomfort was more of a choice driver than those who chose to ordinally mismatch. Together with study 7, these studies suggest that wanting to avoid an uncomfortable social experience is one reason why people exhibit ordinal-attribute matching.

GENERAL DISCUSSION

Understanding how consumers are influenced by others' consumption choices is an important question for both managers and consumers. Our research offers a broad and generalizable conceptual basis for predicting matching: whether product attributes are ordinal or nominal. Across multiple studies, including those with consequential choices and financial implications, we show consumers match others on ordinal attributes but not on nominal attributes. By examining a range of different operationalizations and using different study designs, we provide general support for the importance of the ordinal versus nominal attribute distinction as a predictor of matching. Further, we show that framing an attribute as having instrumental value (ordinal framing) versus not having instrumental value (nominal framing)

significantly increases matching, supporting our matching theory. Finally, we show one mechanism for ordinal-attribute matching is that consumers anticipate social discomfort if they mismatch on such attributes.

Theoretical Implications

Our findings are not explained by existing models of decision making. These findings provide a comprehensive attribute-based conceptual basis for predicting when matching another individual's consumption will occur and the form that such matching will take (see Table 1 for a summary of key theoretical contributions). While most social influence effects are under estimated (Nolan et al. 2008), we show that the extent can be predicted by a simple variable classification. Theoretically, we offer a key bridge between one stream of literature finding that consumers sometimes match (or move towards) others' consumption choices (McFerran et al. 2010; Tanner et al. 2008) and another stream finding that consumers do not (Ariely and Levav 2000; Quester and Steyer 2010). Of note, our results replicate prior work showing that consumers are more likely to match the portion size of a co-consumer; importantly, however, we extend these results by (a) showing that this finding may represent a broader phenomenon whereby consumers match on a range of ordinal attributes and (b) offering one theoretically-driven reason why (i.e., to minimize social discomfort).

Our findings also extend the literatures on ordinal versus nominal variables and on vertical versus horizontal product differentiation to a decidedly social context. The terms "ordinal" and "nominal" are primarily used in the behavioral sciences as statistical terms. Further, the more specific terms vertical and horizontal differentiation are primarily used in economics and quantitative marketing. While recent work by Spiller and Belogolova (2017) extends the vertical and horizontal terms to a consumer context by examining consumers' beliefs

about quality and taste in individual choice, our research builds on this work by considering implications of consumers' beliefs about attribute properties. We also identify distinct social consequences, where another individual's choice can draw other consumers towards a particular level of an ordinal attribute in consumption settings with sequential choice.

These findings thus offer implications not just for integrating existing divergent findings in consumer research but also for research in economics and quantitative modeling. In particular, our research suggests that traditional economic models may be extended to incorporate differing degrees of sequential matching behaviors as a function of whether the attribute is ordinal or nominal. Namely, in social consumption contexts involving consumers making sequential choices, our research suggests that a first mover will exert a greater positive influence on other consumers' demand for the first mover's product if the product options are ordinally-differentiated than if they are nominally-differentiated.

Practical Implications

The professional marketing managers we surveyed held multiple incorrect assumptions. First, they (on average) believed that consumers match in general, including for nominal attributes. Managers with these incorrect beliefs might utilize or advocate non-optimal tactics aimed at highlighting product information (e.g., about their or prior customers' nominal selections), believing that this can promote social influence. Importantly, we also show that marketers can use external cues (e.g., signage) to frame an attribute as more ordinal (instrumental) rather than nominal (non-instrumental) and thus shape the direction of social influence effects (study 6).

Relatedly, marketers may thus be missing opportunities to offer or highlight information about others' ordinal selections. Indeed, there are many contexts in which firms may prefer to

promote certain products (e.g., with higher margins or excess inventory). Our research suggests ways and contexts in which this can be done. For instance, firms can instruct their employees to recommend and strategically present information about their own (or other consumers') ordinal attribute selections and in doing so, increase customers' likelihood of matching on the ordinal attribute; we show this has revenue implications (study 5). Additionally, as most of our studies examine sequential ordering situations involving customers together with their companions, our research suggests that recommenders can (selectively) verbally repeat or emphasize particular information about a first-ordering consumer's choice, depending on whether the recommender hopes that the later-ordering consumer will match the first-ordering consumer's ordinal attribute standing. For instance, as having waitstaff verbally repeat customers' orders is common practice, firms may encourage waitstaff to strategically repeat certain aspects of customers' orders to foster the perception of patrons' social norms. For example, an ice cream scooper trying to increase selection a larger ice cream sizes might verbally repeat size and flavor information when customers select the larger size (e.g., "one large chocolate cone coming up") but only repeat the flavor information when customers select the smaller size (e.g., "one chocolate cone coming up"). Finally, study 4 also allows us to suggest implications for charitable giving opportunities, which may often be presented to multiple consumers in the company of each other. Our findings suggest that marketers of charitable organizations seeking aid ought to strategically highlight ordinal information to increase matching (e.g., about higher monetary donations that are within the realm of what other potential donors might reasonably donate), rather than nominal information (e.g., where the donor selected to allocate funds to).

The second incorrect assumption marketers held was that ordinal and nominal matching occur differently based on product domains. For instance, our survey showed that overall,

marketers predicted significantly greater ordinal matching than nominal matching in two study contexts (ice cream, pasta) but not in three others (wine, donations, granola bars [employee communication]). Marketers thus did not intuit our broader account, which is easier for marketers to apply, as it suggests that extensive marketing research to distinguish between product categories may not be needed.

Finally, from a consumer welfare perspective, our findings suggest that being first to order is one way to minimize the effect of social influence. Especially for consumers having particular health or financial goals, they should be aware that not being the first to order could render them susceptible to ordering larger portions of indulgent foods or to purchasing more expensive versions of products than they might otherwise select.

Future Directions and Additional Insights

A main contribution of our research is to provide a new framework for examining the role of different types of product attributes in social influence. Given the novelty of this framework, our primary focus was on demonstrating its generalizability across multiple attribute operationalizations. However, we anticipate that this research and its framework provides generative potential for future work. One direction is to focus more on nominal attributes and examine when and why consumers mismatch (vs. are not influenced by) others' nominal-attribute selections. For instance, although we generally chose products that we anticipated consumers would individually consume and be fairly familiar with, examining the interplay of such factors as anticipated sharing (Belk 2010), desire for variety (Kahn 1995; Ratner and Kahn 2002), group size (Argo, Dahl, and Manchanda 2005), desires for uniqueness and information gathering (Ariely and Levav 2000), and highly novel nominal attribute levels may be worthwhile, as these factors might predict greater nominal mismatching. Further, perhaps

situations involving strong desire to maximize social group affiliation by conveying shared “tastes” could prompt nominal matching (while ordinal matching may minimize social discomfort, nominal matching may maximize social group affiliation).

Additionally, we focused mainly on the food domain because it is the most common consumption domain in which people choose their own individual products sequentially for relatively immediate joint consumption (and indeed, this is reflected in most consumer behavior literature on social consumption settings). However, we also extended our theory to the prosocial domain in study 4. Future research may further extend our theory to other product domains. For instance, if two consumers go shopping for purses together, our theory predicts that they will match on an ordinal attribute such as the price or brand prestige level, to minimize social discomfort, but will not seek to match on a nominal attribute, such as the color of the purses.

Another direction with theoretical and practical implications is to examine additional underlying antecedents of whether attributes are perceived as relatively more ordinal or nominal. In study 6, we tested one potential antecedent—whether an attribute is perceived as having instrumental value through an ordinal framing. Future work may test other antecedents of perceiving an attribute as more ordinal versus nominal. For instance, while we focused on relatively “conventional” levels for both the ordinal and nominal attributes in our main studies (e.g., 1 vs. 2 scoops of ice cream and chocolate vs. vanilla ice cream), might inclusion of “unconventional” levels alongside “conventional” levels of a typically nominal attribute lead it to be perceived as more ordinal (e.g., ranked from conventional to cool) and thereby increase matching? Future work could test this and other potential antecedents, and may also test various marketing communications to cue consumers to focus either on ordinal or nominal differences between product options, as a way to shape social influence effects.

Another direction for future work is to test whether individual differences moderate the propensity to match on particular ordinal attributes. If so and such individual differences are observable by firms, this may have practical implications for improving customer segment targeting, and may also have societal implications. One interesting individual difference is gender, as there are large gender differences in eating behaviors as related to health. Relevant to our research, Silberstein et al. (1988) found that whereas undergraduate males were as likely to desire being heavier as thinner, virtually no undergraduate females desired being heavier. In our framework's terminology and considering the way we operationalized attributes, females—compared to males—may more consistently and strongly view indulgent food portion sizes as ordinal (i.e., ranked, involving “better”-“worse” comparisons instead of “same”-“different” comparisons) (Mitchell and Dacin 1996). If so, we may observe greater portion-size matching among female-female pairs than male-male pairs. Indeed, an analysis collapsing across the studies involving portion size as the ordinal attribute showed that portion-size matching was higher among female pairs than male pairs; this is consistent with and supports the notion that consumers' perceptions of whether an attribute has ranked levels increase matching likelihood (see Web Appendix E for analysis details). It is worth noting that these findings are consistent with Silberstein et al. (1988)'s findings from over 30 years ago. Although gender views have shifted in the past 30 years (Grau and Zotos 2016), males and females' views on whether weight is ordinal or nominal appear to have changed little. From a societal perspective, these findings suggest that marketing and public health campaigns aimed at increasing body size acceptance—particularly among women—remain both relevant and deserving of further study (Lin and McFerran 2016).

The current findings suggest that more work is needed to fully understand when a higher

versus lower value on the ordinal attribute is the key driver of matching. Summarizing the no information control groups holistically, they suggest that ordinal-matching was driven by: more participants selecting the store brand or lower-priced option when aware a friend had done so (studies 2a, 2b); more participants selecting the larger portion size when aware a friend had done so (study 3); and more participants selecting the lower donation amount when aware a friend had done so (study 4). Table 4 summarizes the analyses of the no information control conditions across studies (Web Appendix E contains details). Collectively, these findings spanning across contexts and ordinal-attribute operationalizations suggest that whether the higher or lower value of the ordinal attribute is the key driver of matching may vary across contexts and may also depend in part on the particular levels of the ordinal attribute.

Relatedly, we present preliminary evidence for minimizing social discomfort as a psychological mechanism for our effect in studies 7 to 8, but as Pham (2013) notes, “many important and interesting consumption phenomena are clearly multiply determined” and “theories are lenses that we use to internalize and generalize empirical observations about the external world” (p. 415). We have shown that the ordinal-matching effect is a generalizable consumption phenomenon across various operationalizations and contexts; it is also likely multiply determined, and the particular mix of processes may vary by context. We encourage future research to examine the various processes that may underlie the ordinal-matching effect.

One major process-oriented question that can be tested is to consider the relative roles of normative versus informational social influence. We have argued that ordinal attributes, more than nominal attributes, allow first-mover consumers to set the socially comfortable level. Future work might systematically test how the ordinal matching effect varies in private versus public settings. For instance, to the extent that the ordinal matching effect is larger in public versus in

private, it points to a larger normative social influence; to the extent that the ordinal matching effect occurs at least somewhat in private, it points to at least some informational social influence. This may vary by contexts: for instance, consumers may infer expertise or information from others' choices on ordinal attributes in the case of wine's price attribute (e.g., inferring from a friend's choice of a lower-priced wine that it is of high enough quality) but less so in the case of others' ice cream portion size.

Future work might also systematically test how the ordinal matching effect varies depending on whether others are choosing vices or virtues. It is possible that a licensing process may operate when observing others choose vices, providing an extra push alongside social discomfort to shift choices in the vice direction (e.g., another's selection of a tempting larger [vs. smaller] portion of ice cream or a cookie [vs. an apple] provides a greater license to select it). By contrast, when observing others choose virtues, licensing is unlikely to provide an extra push and some consumers may even strategically downplay social discomfort to avoid shifting their choices in the virtuous direction.

Of note, the wide range of contexts we examined indicate that some individual mechanisms alone (e.g., licensing) cannot explain every occasion of the ordinal-matching effect (e.g., the dried pasta category is not an indulgence category and unlikely to be subject to a licensing process). Social discomfort does appear though to be one process that can at least partially explain ordinal-matching effects in multiple contexts (study S2 in Web Appendix F).

Finally, although we showed that consumers match the ordinal levels of others' choices, future research may consider alternative behaviors. For instance, when do consumers engage in one-upmanship by choosing different, higher levels on the ordinal attribute (Ordabayeva and Chandon 2011)? One possibility, also based on a social discomfort process, is when concern for

the other person's discomfort is low, such as when co-consuming with a rival coworker rather than a friend. Future work may also consider cases in which consumers still care about minimizing social discomfort and yet do not want to alter their consumption choices to match on the ordinal attribute. For instance, consumers who have strong health goals might strongly prefer a small portion of ice cream—do they persist in choosing a small portion despite a companion choosing a larger one, but then use communication strategies such as explaining that they are not hungry to minimize social discomfort? Or, might they anticipate the pressure to match others on ordinal attributes and thus actively seek to be the first to choose or to pre-emptively make choices for both self and others that are matched on ordinal attributes (Liu et al. 2013), as a way to minimize social discomfort?

Concluding Remarks

Our research offers a new attribute-based conceptual basis for predicting when consumers match others' consumption choices, which allows us to bring together seemingly divergent prior findings and also to predict new findings. We distinguish between ordinal and nominal attributes and find that consumers match others, whether accompanying consumers or employees, on ordinal rather than nominal attributes using a wide range of attribute operationalizations. Further, one reason for ordinal-matching is that consumers aim to minimize anticipated social discomfort for one or both parties. Overall, this conceptual framework offers implications for managerial practice and theory, illustrating the benefits of utilizing an ordinal-nominal perspective when predicting the impact of attribute information in social contexts.

TABLE 1: SUMMARY OF CONTRIBUTIONS TO FOUR LITERATURES

Literature	Contribution to this Literature
<p>Ordinal versus Nominal Variables:</p> <ul style="list-style-type: none"> A general way of classifying variables into ranked versus non-ranked attributes, with practical implications for how variables common in psychology and sociology are statistically analyzed. Ordinal differences enable judgments of better/worse or greater/lesser (as well as same/different), whereas nominal differences only enable judgments of same/different. 	<p>We use the general ordinal/nominal way of classifying variables to predict when matching is more likely to occur (for ordinal attributes) and less likely to occur (for nominal attributes). As vertical attributes represent a more specific instantiation of ordinal attributes and horizontal attributes represent a more specific instantiation of nominal attributes, we extend the typical use of vertical/horizontal differentiation to a social consumption context, predicting that matching is more likely to occur for ordinal (or vertical) attributes and less likely to occur for nominal (or horizontal) attributes.</p>
<p>Vertical versus Horizontal Differentiation:</p> <ul style="list-style-type: none"> Two ways in which products can be differentiated, either in terms of quality-based differences typically linked with price differences (vertical) or taste-based differences (horizontal). Terminology commonly used in economics and quantitative marketing to study managerial questions of competition, industry structure, or individual consumer choice. 	
<p>Matching Others' Consumption: Consumers' consumption choices following co-consumers in sequential consumption settings match others' consumption decisions.</p>	<p>We provide one way of resolving these differing findings, suggesting a broad product-attribute based conceptualization wherein consumers match others on ordinal attributes and not on nominal attributes.</p>
<p>Not Matching Others' Consumption: Consumers' consumption choices following co-consumers in sequential consumption settings do not match others' consumption decisions.</p>	

Notes: Tables B1-B4 in Web Appendix B provide examples of references for prior work using ordinal versus nominal terminology (Table B1), prior work using vertical versus horizontal terminology (Table B2), marketing findings on matching in social consumption contexts (Table B3), and marketing findings on non-matching in social consumption contexts (Table B4). Table 1 illustrates how our research builds on and extends these four literatures.

TABLE 2: OPERATIONALIZATION ACROSS STUDIES

	Ordinal Attribute (Attribute levels are ranked)	Nominal Attribute (Attribute levels are not ranked)
Marketing Manager Survey (Web Appendix A)	S1: pasta brands wine prices ice cream portions donation amounts granola bar brands	S1: pasta shapes wine flavors ice cream flavors donation causes granola bar flavors
Secondary Data: Correlational Evidence	Pilot: healthiness	Pilot: flavor
Basic Effect with Varying Operationalizations, Increasing Generalizability and Addressing Alternative Explanations	1: small vs. medium cake slice	1: chocolate vs. vanilla cake
	2a: store vs. national brand pasta	2a: penne vs. spaghetti pasta shape
	2b: \$4 vs. \$8 glass of wine ^a	2b: fruity vs. earthy wine
	3: 1 vs. 2 scoops of ice cream	3: chocolate vs. vanilla ice cream
	4: \$0.25 vs. \$0.50 donation	4: polar bear vs. elephant donation cause
Framing an Attribute as Ordinal vs. Nominal	5: store (\$0.50) vs. national (\$0.75) brand bar	5: chocolate chip vs. peanut butter bar
	6: framing pasta shape as ordinal (instrumental)	6: framing pasta shape as nominal (non-instrumental)
An Underlying Process, involving Social Discomfort	7: 1 vs. 2 scoops of ice cream	7: chocolate vs. vanilla ice cream
	8: 1 vs. 2 scoops of ice cream	8: chocolate vs. vanilla ice cream
Social Discomfort across Contexts (Web Appendix F)	S2: 1 vs. 2 scoops of ice cream \$4 vs. \$8 glass of wine store vs. national brand pasta	S2: chocolate vs. vanilla ice cream fruity vs. earthy wine penne vs. spaghetti pasta shape

TABLE 3: SUMMARY OF RESULTS BY STUDY CONDITION ACROSS STUDIES

A. Pilot Study: Perceived Similarity to Companion (N = 140; M _{age} = 28.55; Vietnamese restaurant in U.S.)					
2-level within-subjects design	Healthiness (N = 140)			Flavor (N = 140)	
DV: Perceived similarity	5.51 (.11)			4.69 (.16)	
Main findings: Participants perceived more similarity with their companion(s) on an ordinal attribute (healthiness) than a nominal attribute (flavor).					
B. Study 1: Real Cake Choice Shares by Condition (N = 186; M _{age} = 20.19; Students)					
2 × 2 between-subjects design					
IV: Chat Partner's Choice					
	Small Chocolate (N = 47)	Small Vanilla (N = 46)	Medium Chocolate (N = 47)	Medium Vanilla (N = 46)	
DV: Choice Shares					
Small Chocolate	31.9%	37.0%	25.5%	15.2%	
Small Vanilla	36.2%	34.8%	12.8%	19.6%	
Medium Chocolate	25.5%	13.0%	36.2%	45.7%	
Medium Vanilla	6.4%	15.2%	25.5%	19.6%	
Main findings: Participants matched their chat partner more on an ordinal attribute (portion size) than on a nominal attribute (flavor).					
C. Study 2A: Pasta Choice Shares by Condition (N = 422; M _{age} = 35.88; MTurk)					
2 × 2 (+1 control) between-subjects design					
IV: Friend's Choice					
	Great Value Penne (N = 83)	Great Value Spaghetti (N = 85)	Barilla Penne (N = 83)	Barilla Spaghetti (N = 83)	Control (N = 86)
DV: Choice Shares					
Great Value Penne	28.9%	22.4%	31.3%	17.6%	20.9%
Great Value Spaghetti	34.9%	35.3%	20.5%	28.2%	20.9%
Barilla Penne	16.9%	27.1%	19.3%	29.4%	31.4%
Barilla Spaghetti	19.3%	15.3%	28.9%	24.7%	26.7%
Main findings: Participants matched their friend more on an ordinal attribute (brand prestige) than on a nominal attribute (shape).					
D. Study 2B: Wine Choice Shares by Condition (N = 315; M _{age} = 37.14; MTurk)					
2 × 2 (+1 control) between-subjects design					
IV: Friend's Choice					
	Cheap Fruity (N = 62)	Cheap Earthy (N = 63)	Expensive Fruity (N = 63)	Expensive Earthy (N = 64)	Control (N = 63)
DV: Choice Shares					
Cheap Fruity	38.7%	50.8%	44.4%	43.8%	50.8%
Cheap Earthy	37.1%	23.8%	17.5%	12.5%	14.3%
Expensive Fruity	17.7%	12.7%	19.0%	35.9%	27.0%
Expensive Earthy	6.5%	12.7%	19.0%	7.8%	7.9%
Main findings: Participants matched their friend more on an ordinal attribute (price) than on a nominal attribute (flavor).					
E. Study 3: Ice Cream Choice Shares by Condition (N = 378; M _{age} = 37.29; MTurk)					
2 + 2 (+1 control) between-subjects design					
IV: Friend's Choice					
	Small (N = 76)	Large (N = 76)	Chocolate (N = 75)	Vanilla (N = 76)	Control (N = 75)
DV: Choice Shares					
Small Chocolate	30.3%	17.1%	22.7%	25.0%	32.0%
Small Vanilla	27.6%	21.1%	30.7%	25.0%	26.7%
Large Chocolate	21.1%	36.8%	26.7%	32.9%	24.0%
Large Vanilla	21.1%	25.0%	20.0%	17.1%	17.3%
Main findings: Participants matched their friend more on an ordinal attribute (portion size) than on a nominal attribute (flavor).					
F. Study 4: Real Donation Choice Shares by Condition (N = 409 [choice shares focus on 294 who opted to donate]; M _{age} = 36.70; MTurk)					
2 × 2 (+1 control) between-subjects design					
IV: Partner's Choice					
	\$0.25 Polar Bear (N = 55)	\$0.25 Elephant (N = 57)	\$0.50 Polar Bear (N = 57)	\$0.50 Elephant (N = 57)	Control (N = 64)
DV: Choice Shares					
\$0.25 Polar Bear	34.5%	56.1%	26.3%	31.6%	35.9%
\$0.25 Elephant	47.3%	17.5%	24.6%	15.8%	23.4%

\$0.50 Polar Bear	7.3%	12.3%	26.3%	47.4%	20.3%
\$0.50 Elephant	10.9%	14.0%	22.8%	12.3%	20.3%
<i>Main findings: Participants matched their partner more on an ordinal attribute (donation amount) than on a nominal attribute (donation cause).</i>					
<i>G. Study 5: Real Granola Bar Purchase Choice Shares by Condition (N = 162; M_{age} = 20.26; Students)</i>					
<i>IV: Store Employee's Choice</i>					
<i>2 × 2 between-subjects design</i>	<i>Great Value Chocolate (N = 37)</i>	<i>Great Value Peanut (N = 36)</i>	<i>Quaker Chocolate (N = 46)</i>	<i>Quaker Peanut (N = 43)</i>	
<i>DV: Choice Shares</i>					
Great Value Chocolate	24.3%	30.6%	13.0%	20.9%	
Great Value Peanut	32.4%	25.0%	10.9%	25.6%	
Quaker Chocolate	29.7%	13.9%	34.8%	32.6%	
Quaker Peanut	13.5%	30.6%	41.3%	20.9%	
<i>Main findings: Participants matched the store employee more on an ordinal attribute (brand prestige) than on a nominal attribute (flavor).</i>					
<i>H. Study 6: Pasta Matching by Condition (N = 207; M_{age} = 39.15; MTurk)</i>					
<i>IV: Framing [Replicate - Friend's Choice]</i>					
<i>2-group between-subjects design (2 stimulus replicates)</i>	<i>Nominal [Orecchiette] (N = 52)</i>	<i>Ordinal [Orecchiette] (N = 51)</i>	<i>Nominal [Pappardelle] (N = 51)</i>	<i>Ordinal [Pappardelle] (N = 53)</i>	
<i>DV: % Matching</i>	42.3%	60.8%	37.3%	56.6%	
<i>Main findings: Participants matched their friend's pasta choice more when pasta shape was framed as ordinal versus nominal.</i>					
<i>I. Study 7: Social Consequences of Mis(matching) (N = 198; M_{age} = 35.65; MTurk)</i>					
<i>IV: Attribute Mis(matching)</i>					
<i>2 × 2 between-subjects design</i>	<i>Size Match Only (N = 52)</i>	<i>Complete Match (N = 52)</i>	<i>Flavor Match Only (N = 50)</i>	<i>No Match (N = 46)</i>	
<i>DV1: Negative social consequences</i>	1.42 (.11)	1.50 (.10)	1.94 (.17)	1.77 (.16)	
<i>DV2: Positive social consequences</i>	3.60 (.21)	3.86 (.18)	3.36 (.18)	3.14 (.17)	
<i>Main findings: Participants perceived more negative social consequences and less positive social consequences from size mismatching (vs. matching) and no effect on social consequences from flavor mismatching (vs. matching).</i>					
<i>J. Study 8: Ice Cream Choice Shares by Condition; Minimize Social Discomfort as a Choice Driver (N = 190; M_{age} = 19.69; Student)</i>					
<i>IV: Friend's Choice</i>					
<i>2 × 2 between-subjects design</i>	<i>Small Chocolate (N = 47)</i>	<i>Small Vanilla (N = 47)</i>	<i>Large Chocolate (N = 48)</i>	<i>Large Vanilla (N = 48)</i>	
<i>DV1: Choice Shares</i>					
Small Chocolate	34.0%	31.9%	16.7%	22.9%	
Small Vanilla	44.7%	44.7%	10.4%	16.7%	
Large Chocolate	10.6%	12.8%	31.3%	22.9%	
Large Vanilla	10.6%	10.6%	41.7%	37.5%	
<i>IV: Participant Groupings</i>					
	<i>Size Match Only (N = 67)</i>	<i>Complete Match (N = 70)</i>	<i>Flavor Match Only (N = 26)</i>	<i>No Match (N = 27)</i>	
<i>DV2: Minimize social discomfort</i>	1.89 (.17)	1.75 (.19)	1.25 (.14)	1.44 (.18)	
<i>Main findings: Participants matched their friend more on an ordinal attribute (portion size) than on a nominal attribute (flavor). Participants who matched (vs. mismatched) on size said minimizing social discomfort was more of a choice driver.</i>					
<i>K. Study S2 (Web Appendix): Social Consequences of Mis(matching) across Various Products and Attributes (N = 156; M_{age} = 34.93; MTurk)</i>					
<i>Replicate</i>					
<i>2-level within-subjects design (3 stimulus replicates)</i>	<i>Ice Cream (N = 50)</i>		<i>Wine (N = 52)</i>	<i>Pasta (N = 54)</i>	
<i>DV1: Social discomfort of ordinal mismatching</i>	1.61 (.11)		1.37 (.10)	1.50 (.11)	
<i>DV2: Social discomfort of nominal mismatching</i>	1.16 (.07)		1.19 (.07)	1.28 (.09)	
<i>Main findings: Participants perceived more social discomfort from ordinal mismatching than from nominal mismatching, across three different stimulus replicates with different ways of operationalizing ordinal and nominal attributes.</i>					

Notes: For choice shares, percentages indicate choice shares within each condition. Statistical comparisons of the degree of matching for most studies is provided in Table 4. For scale responses, means are provided with standard errors in the parentheses following the means.

TABLE 4: MATCHING OR MISMATCHING ACROSS STUDIES 1, 2A-2B, 4, 5, 8^a

Study	Number of Participants				Exact Binomial Tests		
	Ordinal Match Only	Complete Match	Nominal Match Only	No Match	Test for Ordinal Matching ^b	Test for Nominal Matching ^b	Test for Greater Ordinal-Only Matching than Nominal-Only Matching ^c
1	67	57	40	22	<.001	.304	.006
2a	90	56	55	51	.007	.975	.002
2b	97	91	77	71	.017	.522	.075
4	98	51	36	45	<.001	>.999	<.001
5	56	43	39	24	.003	.469	.050
8	67	70	26	27	<.001	.471	<.001
Total (6 studies)	475	368	273	240	<.001	.978	<.001

^a Studies 3, 6, and 7 use a different design, which does not enable grouping participants into four groups in this way.

^b These exact binomial tests reflect the proportion of each type of matching versus a default of a 50/50 choice share ($p = .5$), with the p -values indicating the probability of exactly, or more than, the observed proportion of matchers compared to 50/50 (i.e., is the proportion of ordinal matchers vs. ordinal non-matchers greater than 50/50; is the proportion of nominal matchers vs. nominal non-matchers greater than 50/50). As an example, the exact binomial test for ordinal matching for study 1 is conducted with $n = 186$, $k = 124$ (ordinal match only + complete match), and the benchmark $p = .5$, yielding a probability (p) of observing exactly, or more than, 124 (k) out of 186 (n) of $< .001$.

^c For this exact binomial test, we adjusted the sample size (n) to exclude those who were a complete match and those who were a no match. These exact tests thus reflect a comparison of the proportion of ordinal matching with the proportion of nominal matching, with the p -values indicating the probability of exactly, or more than, the observed proportion of ordinal matchers compared to 50/50 (i.e., is the proportion of ordinal-only matchers vs. nominal-only matchers greater than 50/50).

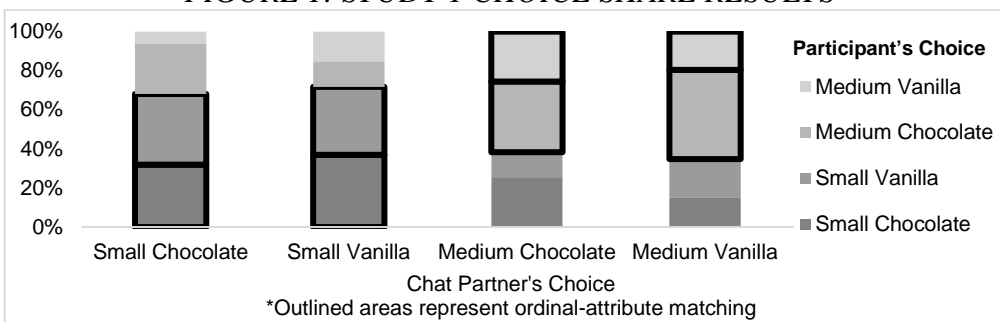
TABLE 5: SUMMARY OF THE NO INFORMATION CONTROL CONDITIONS

Study	Context	Ordinal Attribute ("Lower" vs. "Higher")	Participant Choices (% choosing "Higher" Level)			Conclusion
			No Information Control	Other Chooses "Lower" Level	Other Chooses "Higher" Level	
2a	Pasta purchase	Brand prestige (store, national)	58.1% ^a	39.3% ^b	51.2% ^a	Ordinal matching appears driven by more participants selecting the "lower" level (store brand) if the other chooses the "lower" level.
2b	Wine purchase	Price (\$4, \$8)	34.9% ^{a,b}	24.8% ^a	40.9% ^b	Ordinal matching does not appear clearly driven primarily by either direction.
3	Ice cream purchase	Portion size (1 scoop, 2 scoops)	41.3% ^a	42.1% ^a	61.8% ^b	Ordinal matching appears driven by more participants selecting the "higher" level (a larger portion) if the other chooses the "higher" level.
4	Donation	Donation amount (\$0.25, \$0.50)	40.6% ^a	22.3% ^b	52.5% ^a	Ordinal matching appears driven by more participants donating the "lower" level (\$0.25) if the other donates the "lower" level.

^{a, b}

For each row in the table, means that have no superscript in common are significantly different at $p < .05$. For example, in study 2a, the two treatment conditions are significantly different from each other, and the control condition is significantly different from the "other chooses 'lower' level" condition but not the "other chooses 'higher' level" condition. As another example, in study 2b, the two treatment conditions are significantly different from each other, but neither treatment condition is significantly different from the control condition. The comparisons are from binary logistic regressions conducted with the independent variable coded using two dummy variables to represent the three conditions, and the outcome variable coded with 1 = participant chooses "higher" level on the ordinal attribute and 0 = participant chooses "lower" level on the ordinal attribute. Web Appendix E contains additional details on these statistical analyses.

FIGURE 1: STUDY 1 CHOICE SHARE RESULTS



Note. Figures 1-5 and 7 depict participants' choice shares as a function of the other individual's choice. The outlined areas within each column represent the choice share of participants who matched the other individual's choice on the ordinal attribute. To test for a significant ordinal-attribute matching effect in studies 1, 2a-2b, 4-5, and 8, we conducted a logistic regression to test for a significant effect of the other individual's ordinal-attribute choice (coded to be binary, collapsing across nominal-attribute choice) on participants' ordinal-attribute choices (coded to be binary, collapsing across nominal-attribute choice). We also conducted an alternative analysis consisting of an exact binomial analysis comparing the choice share of ordinal matchers versus mismatches, leading to similar conclusions (Table 2, column 6). Finally, we also conducted another analysis comparing the choice share of ordinal-only matchers versus nominal-only matchers (Table 2, column 8).

FIGURE 2A: STUDY 2A CHOICE SHARE RESULTS

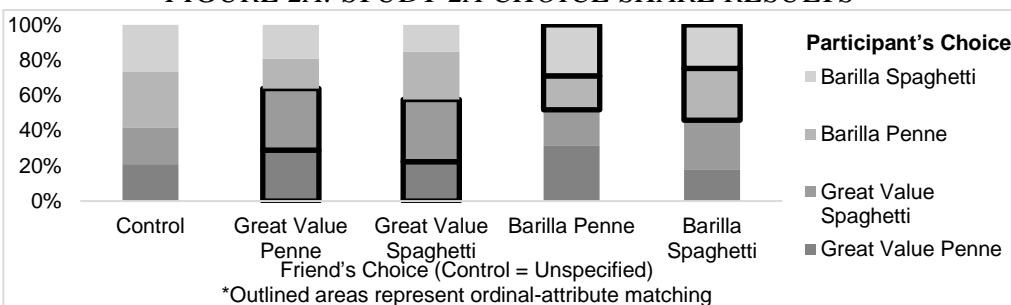


FIGURE 2B: STUDY 2B CHOICE SHARE RESULTS

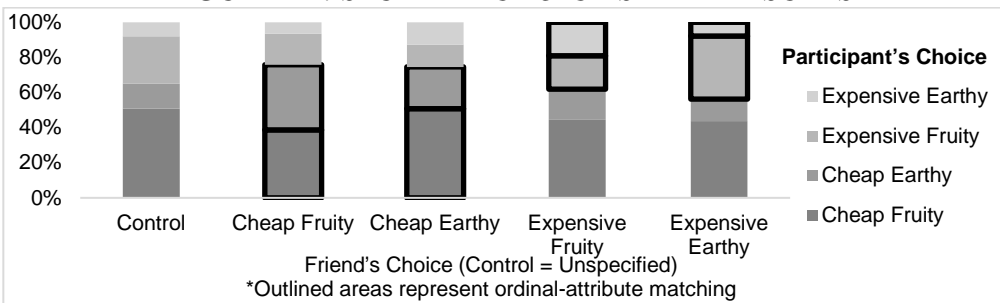
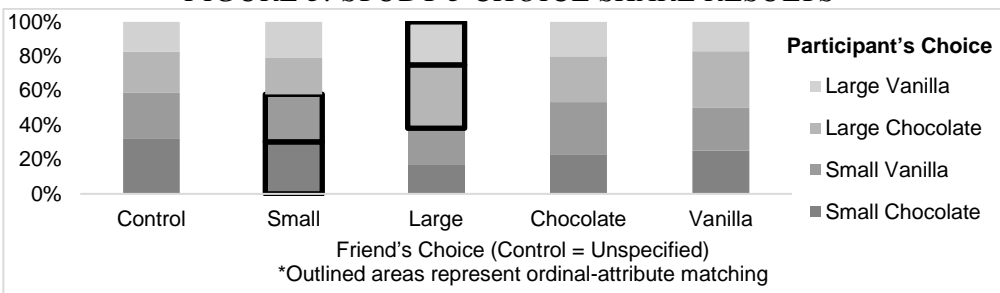


FIGURE 3: STUDY 3 CHOICE SHARE RESULTS



Note. To test for a significant ordinal-attribute matching effect in study 3, we focus on the small condition versus the large condition and test for a significant effect of size condition on participants' ordinal-attribute choices (coded to be binary: small or large). We also conducted a logistic regression comparing the choice share of matching in the ordinal information conditions versus the nominal information conditions (as participants in study 3 receive information about their friend's standing only on one attribute, not both).

FIGURE 4: STUDY 4 CHOICE SHARE RESULTS

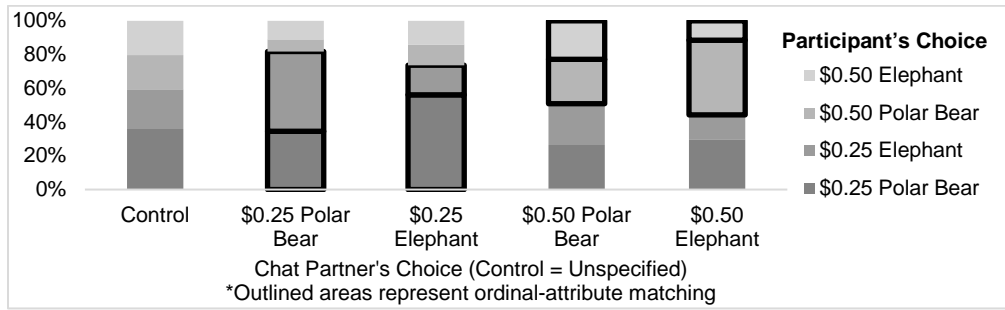


FIGURE 5: STUDY 5 CHOICE SHARE RESULTS

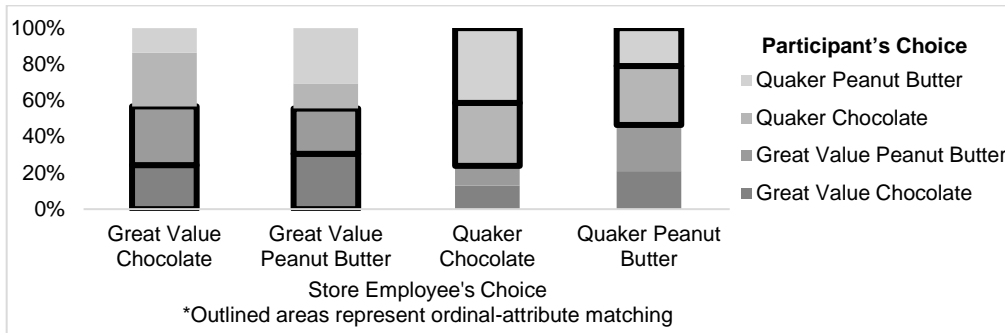
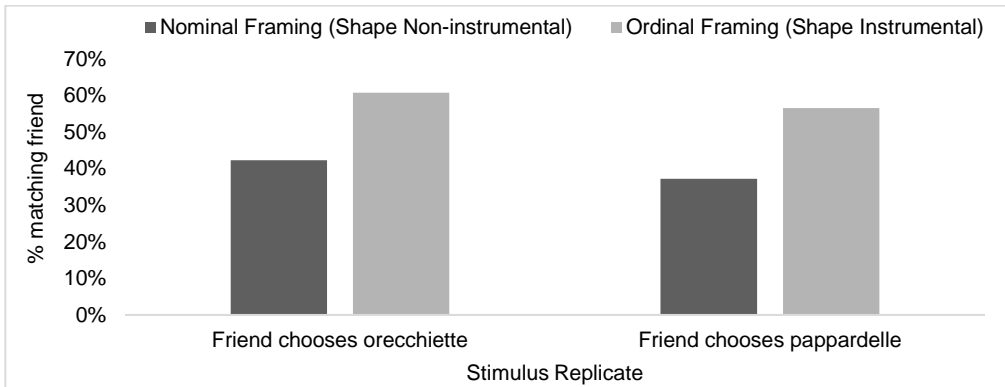
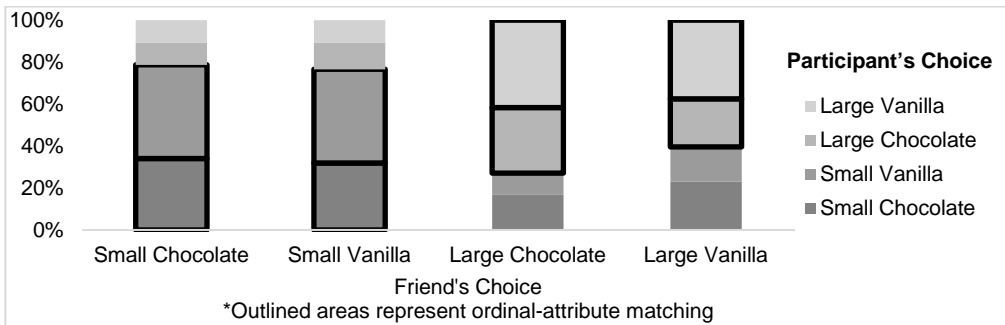


FIGURE 6: STUDY 6 CHOICE SHARE RESULTS



Note. Figure 6 depicts the percentage of participants who matched their friend's shape as a function of framing condition (nominal vs. ordinal), for both stimulus replicates.

FIGURE 7: STUDY 8 CHOICE SHARE RESULTS



REFERENCES

- Anderson, Joanna E. and David Dunning (2014), "Behavioral Norms: Variants and Their Identification," *Social and Personality Psychology Compass*, 8 (12), 721-38.
- Argo, Jennifer J., Darren W. Dahl, and Rajesh V. Manchanda (2005), "The Influence of a Mere Social Presence in a Retail Context," *Journal of Consumer Research*, 32 (2), 207-12.
- Argo, Jennifer J., Katherine White, and Darren W. Dahl (2006), "Social Comparison Theory and Deception in the Interpersonal Exchange of Consumption Information," *Journal of Consumer Research*, 33 (1), 99-108.
- Ariely, Dan and Jonathan Levav (2000), "Sequential Choice in Group Settings: Taking the Road Less Traveled and Less Enjoyed," *Journal of Consumer Research*, 27 (3), 279-90.
- Asch, Solomon E. (1955), "Opinions and Social Pressure," *Scientific American*, 193 (5), 31-35.
- Aydinoğlu, NİLüfer Z. and Aradhna Krishna (2011), "Guiltless Gluttony: The Asymmetric Effect of Size Labels on Size Perceptions and Consumption," *Journal of Consumer Research*, 37 (6), 1095-112.
- Belk, Russell W. (2010), "Sharing," *Journal of Consumer Research*, 36 (5), 715-34.
- Berger, Jonah and Chip Heath (2007), "Where Consumers Diverge from Others: Identity Signaling and Product Domains," *Journal of Consumer Research*, 34 (2), 121-34.
- Burnkrant, Robert E. and Alain Cousineau (1975), "Informational and Normative Social Influence in Buyer Behavior," *Journal of Consumer Research*, 2 (3), 206-15.
- Chan, Cindy, Jonah Berger, and Leaf Van Boven (2012), "Identifiable but Not Identical: Combining Social Identity and Uniqueness Motives in Choice," *Journal of Consumer Research*, 39 (3), 561-73.
- Chartrand, Tanya and John Bargh (1999), "The Chameleon Effect: The Perception-Behavior Link and Social Interaction," *Journal of Personality and Social Psychology*, 76 (6), 893-910.
- Cialdini, Robert B. (1985), *Influence*. Glenview, IL: Scott, Foresman and Company.
- Dobson, Paul W. and Eitan Gerstner (2010), "For a Few Cents More: Why Supersize Unhealthy Food?," *Marketing Science*, 29 (4), 770-78.
- Exline, Julie Juola and Marci Lobel (1999), "The Perils of Outperformance: Sensitivity About Being the Target of a Threatening Upward Comparison," *Psychological Bulletin*, 125 (3), 307-37.
- Festinger, Leon (1954), "A Theory of Social Comparison Processes," *Human Relations*, 7 (2), 117-40.
- Fiske, Susan T. (1980), "Attention and Weight in Person Perception: The Impact of Negative and Extreme Behavior," *Journal of Personality and Social Psychology*, 38 (6), 889-906.
- Gabszowicz, J. Jaskold and J.-F. Thisse (1986), "On the Nature of Competition with Differentiated Products," *Economic Journal*, 96 (381), 160-72.
- Gneezy, Ayelet, Uri Gneezy, and Dominique Olié Lauga (2014), "A Reference-Dependent Model of the Price-Quality Heuristic," *Journal of Marketing Research*, 51 (2), 153-64.
- Goldstein, Noah J., Robert B. Cialdini, and Vladas Griskevicius (2008), "A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels," *Journal of Consumer Research*, 35 (3), 472-82.
- Grau, Stacy Landreth and Yorgos C. Zotos (2016), "Gender Stereotypes in Advertising: A Review of Current Research," *International Journal of Advertising*, 35 (5), 761-70.

- Haws, Kelly L. and Karen Winterich (2013), "When Value Trumps Health in a Supersized World," *Journal of Marketing*, 77, 48-64.
- Herr, Paul M., Frank R. Kardes, and John Kim (1991), "Effects of Word-of-Mouth and Product-Attribute Information on Persuasion: An Accessibility-Diagnosticity Perspective," *Journal of Consumer Research*, 17 (4), 454-62.
- Huber, Joel and John McCann (1982), "The Impact of Inferential Beliefs on Product Evaluations," *Journal of Marketing Research*, 19 (3), 324-33.
- Kahn, Barbara E. (1995), "Consumer Variety-Seeking among Goods and Services: An Integrative Review," *Journal of Retailing and Consumer Services*, 2 (3), 139-48.
- Kahneman, Daniel and Amos Tversky (1979), "Prospect Theory: An Analysis of Decision under Risk," *Econometrica*, 47 (2), 263-91.
- Lakin, Jessica L., Tanya L. Chartrand, and Robert M. Arkin (2008), "I Am Too Just Like You: Nonconscious Mimicry as an Automatic Behavioral Response to Social Exclusion," *Psychological Science*, 19 (8), 816-22.
- Lin, Lily and Brent McFerran (2016), "The (Ironic) Dove Effect: Use of Acceptance Cues for Larger Body Types Increases Unhealthy Behaviors," *Journal of Public Policy & Marketing*, 35 (1), 76-90.
- Liu, Peggy J., Troy H. Campbell, Gavan J. Fitzsimons, and Gráinne M. Fitzsimons (2013), "Matching Choices to Avoid Offending Stigmatized Group Members," *Organizational Behavior and Human Decision Processes*, 122 (2), 291-304.
- Lowe, Michael L. and Kelly L. Haws (2014), "(Im) Moral Support: The Social Outcomes of Parallel Self-Control Decisions," *Journal of Consumer Research*, 41 (2), 489-505.
- McFerran, Brent, Darren W. Dahl, Gavan J. Fitzsimons, and Andrea C. Morales (2010), "I'll Have What She's Having: Effects of Social Influence and Body Type on the Food Choices of Others," *Journal of Consumer Research*, 36 (6), 915-29.
- Mitchell, Andrew A. and Peter A. Dacin (1996), "The Assessment of Alternative Measures of Consumer Expertise," *Journal of Consumer Research*, 23 (3), 219-39.
- Nolan, Jessica M., P Wesley Schultz, Robert B. Cialdini, Noah J. Goldstein, and Vladas Griskevicius (2008), "Normative Social Influence Is Underdetected," *Personality and Social Psychology Bulletin*, 34 (7), 913-23.
- Ordabayeva, Nailya and Pierre Chandon (2011), "Getting Ahead of the Joneses: When Equality Increases Conspicuous Consumption among Bottom-Tier Consumers," *Journal of Consumer Research*, 38 (1), 27-41.
- Pham, Michel Tuan (2013), "The Seven Sins of Consumer Psychology," *Journal of Consumer Psychology*, 23 (4), 411-23.
- Quester, Pascale and Alexandre Steyer (2010), "Revisiting Individual Choices in Group Settings: The Long and Winding (Less Traveled) Road?," *Journal of Consumer Research*, 36 (6), 1050-57.
- Ratner, Rebecca K. and Barbara E. Kahn (2002), "The Impact of Private Versus Public Consumption on Variety-Seeking Behavior," *Journal of Consumer Research*, 29 (2), 246-57.
- Silberstein, Lisa R., Ruth H. Striegel-Moore, Christine Timko, and Judith Rodin (1988), "Behavioral and Psychological Implications of Body Dissatisfaction: Do Men and Women Differ?," *Sex Roles*, 19 (3-4), 219-32.

- Skowronski, John J. and Donal E. Carlston (1987), "Social Judgment and Social Memory: The Role of Cue Diagnosticity in Negativity, Positivity, and Extremity Biases," *Journal of Personality and Social Psychology*, 52 (4), 689-99.
- Spiller, Stephen A. and Lena Belogolova (2017), "On Consumer Beliefs About Quality and Taste," *Journal of Consumer Research*, 43 (6), 970-91.
- Stevens, Stanley Smith (1946), "On the Theory of Scales of Measurement," *Science*, 103 (2684), 677-80.
- Tanner, Robin J., Rosellina Ferraro, Tanya L. Chartrand, James R. Bettman, and Rick Van Baaren (2008), "Of Chameleons and Consumption: The Impact of Mimicry on Choice and Preferences," *Journal of Consumer Research*, 34 (6), 754-66.
- Tian, Kelly Tepper, William O. Bearden, and Gary L. Hunter (2001), "Consumers' Need for Uniqueness: Scale Development and Validation," *Journal of Consumer Research*, 28 (1), 50-66.
- Vartanian, Lenny R., Samantha Spanos, C. Peter Herman, and Janet Polivy (2015), "Modeling of Food Intake: A Meta-Analytic Review," *Social Influence*, 10 (3), 119-36.