The Effect of Attribute Alignability on Service Evaluation: The Moderating Role of Uncertainty

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Prior research suggests that consumers make trade-offs between two products by focusing more on alignable differences (i.e., the values of the options on the same attributes are different) than on nonalignable differences (i.e., the options have different attributes). The present research applies the structural alignment model to examine how uncertainty associated with the evaluation of services may lead to greater reliance on nonalignable attributes, especially for credence services. The results of three studies provide support for the uncertainty hypothesis. Specifically, study 1 showed that consumers rely more on alignable attributes when evaluating experience services, but shift their focus to nonalignable attributes when evaluating credence services that are associated with greater uncertainty. Using different operationalizations of uncertainty, studies 2 and 3 provided further support for the uncertainty hypothesis by systematically varying the ambiguity of consumer reviews (study 2) and consumer confidence in their judgment (study 3).

Extant research on consumer information processing and decision making has disproportionately focused on tangible products, with little attention paid to how consumers make decisions relating to services (Ariely 2000; Bettman, Johnson, and Payne 1991; Kahn 1995). As a result, we do not have a good understanding of how consumers make decisions for services, despite the fact that distinctions between goods and services (e.g., intangibility, heterogeneity, inseparability, and perishability) are well documented in the literature (Zeithaml, Parasuraman, and Berry 1985). There are good reasons to believe that consumers may engage in different decision-making processes while evaluating services. In particular, the intangibility of services often makes it difficult to assess the quality of services (Mittal 1999). In practical terms, while most products can be evaluated by actual experience, either before or after purchase, the same cannot be said of services. To illustrate, when an individual is trying to buy a car, he or she can actually experience the ride of the car by taking it out for a test drive before making the purchase decision. But when one is deciding on, say, a medical service such as surgery, it is impractical, if not impossible, to get a trial operation before making the purchase decision. However, not all services are as difficult to assess as surgery (Lovelock 1983). Services vary in terms of the ease with which they could be evaluated, depending on the mix of their experience and credence attributes (Darby and Karni 1973; Keh and Pang 2010; Zeithaml 1981). Experience at-
tributes are those attributes that can be evaluated with actual experience of the product or service, whereas credence attributes are difficult to evaluate even with experience—they have to be taken on faith. A relevant question that arises is: How do consumers evaluate services and make brand choice decisions when service options vary in terms of their mix of experience and credence attributes? Our research aims to address this question by extending the structural alignment theory to examine how consumers make decisions regarding service options.

Structural alignment theory makes the distinction between two types of differences across options—alignable attributes (i.e., attributes that are shared but vary in value across options) and nonalignable attributes (i.e., attributes that belong to only one option). Prior research suggests that while consumers usually make decisions based on alignable attributes, they may shift their focus to nonalignable attributes when they expend cognitive resources (Kivetz and Simonson 2000). Our view is that consumers’ reliance on alignable versus nonalignable attributes may also vary depending on the level of uncertainty associated with the evaluation—the greater the uncertainty associated with the evaluation task, the more likely will consumers rely on nonalignable attributes. We explore this uncertainty hypothesis in the context of services because services involve intangible attributes, the assessment of which is often considered to be more risky and uncertain than the assessment of products (Murray and Schlacter 1990); this is especially the case with credence services (Keh and Sun 2008; Mitra, Reiss, and Capella 1999). Our hypothesis is that the higher uncertainty associated with credence (vs. experience) services leads to the greater use of nonalignable attributes than alignable attributes.

In the next section, we first review the relevant literature that forms the basis of our hypothesis that consumers place different weights on alignable versus nonalignable attributes, depending on the type of service options they are evaluating. We further hypothesize that the differential weighting of attributes is driven by the extent of uncertainty underlying their decisions. We then report the results of two pilot tests and three studies designed to test the hypotheses. Specifically, the pilot studies investigated how people perceive alignable versus nonalignable attributes in terms of their differentiability and importance. Then study 1 examined the differential weighting of alignable and nonalignable attributes in the evaluation of experience services and credence services. The next two studies were designed to examine the proposed mechanism of uncertainty that underlies the differential weighting of these attributes. In study 2, we manipulated uncertainty by varying the ambiguity of brand information and showed that uncertainty led to consumers’ greater reliance on nonalignable versus alignable attributes. In study 3, we primed participants with confidence or doubt prior to presenting them with information of two service options and presented convergent evidence for the mediating role of uncertainty on consumers’ processing of services.

We conclude by discussing the theoretical and managerial implications of the findings.

THE STRUCTURAL ALIGNMENT MODEL

Consumers make trade-offs on a daily basis. Often they are faced with multiple options, with each option having a competitive advantage on some attributes but a disadvantage on others. The structural alignment model of similarity suggests that whether the competitive advantage is based on alignable or nonalignable attributes has important implications on consumers’ evaluation of the options and their final choice decision (Gentner and Markman 1997). Alignable attributes are common to both options, with each option possessing the attributes at different levels (e.g., the average price of an entrée at restaurant A is $25, while the average price of an entrée at restaurant B is $18), whereas nonalignable attributes are unique to one option and absent in the other (e.g., restaurant A offers a children’s menu, while restaurant B has live jazz music every Friday evening). That is, for any given attribute of an option, if consumers can find a corresponding attribute in another option but at a different level, the attribute is an alignable difference. If there is no corresponding attribute in the other option, then the attribute is a nonalignable difference (Zhang and Markman 2001).

The typical finding in prior research is that people rely more on alignable than on nonalignable differences when making comparisons and choice decisions, mostly because processing nonalignable differences is more effortful. To illustrate, it has been shown that alignable versus nonalignable differences are cited more often as justifications for decisions (Markman and Medin 1995); they are also better remembered and mentioned more often in the evaluation process (Zhang and Markman 1998). Further, consumers have been reported to be more satisfied with the choice process when choosing from an alignable choice set than from a nonalignable choice set (Zhang and Fitzsimons 1999). The general agreement is that people pay more attention to and rely more on alignable than nonalignable differences when comparing between different options.

Nonetheless, conditions under which people pay more attention to nonalignable (vs. alignable) attributes in decision making have also been documented. For example, Zhang, Kardes, and Cronley (2002) find that people’s need for cognitive closure moderates their processing of nonalignable attributes—consumers with high need for cognitive closure (who presumably prefer clear-cut, easy-to-process information and avoid thinking about complex, ambiguous information) formed less favorable inferences about the more difficult to process nonalignable attributes, whereas those with low need for cognitive closure did not demonstrate such bias in their processing. Further, Kivetz and Simonson (2000) find that consumers with high (vs. low) need for cognition pay more attention to missing information when evaluating two options. These findings, showing that people are more likely to rely on nonalignable attributes when they are motivated to process information,
have important implications for understanding how customers evaluate services.

**THE RELATIVE WEIGHTING OF ALIGNABLE AND NONALIGNABLE ATTRIBUTES**

While differences between products and services are well documented (Bolton and Alba 2006; Zeithaml et al. 1985), the one key difference that is relevant to the present research is the intangibility of services. The implication of the intangible nature of services is that there is greater ambiguity and uncertainty related to evaluating services than to evaluating products; this is especially true when consumers are evaluating credence services (Keh and Pang 2010; Keh and Sun 2008; Ostrom and Iacobucci 1995). As a result of the greater uncertainty, consumers often pay more attention and engage in greater deliberation when they are comparing between different credence (vs. experience) service options.

Past research suggests that consumers rely on alignable (vs. nonalignable) attributes because they are unwilling to expend cognitive resources to process the nonalignable attributes (Zhang and Fitzsimons 1999). The corollary is that they will shift their focus to nonalignable attributes when they are motivated to process information. Consistent with this view, it has been shown that consumers who are motivated to process information are more influenced by missing values (Nowlis and Simonson 1997), and involved consumers tend to pay more attention to nonalignable than alignable differences (Zhang and Markman 2001), as do those who have high need for cognition (Kivetz and Simonson 2000).

Relative to products, services and, in particular, credence services are typically associated with lower levels of consumer knowledge, higher risk perceptions, greater uncertainties of the outcome, and lower consumer confidence in their ability to evaluate the quality of the service (Keh and Sun 2008; Mitra et al. 1999; Murray and Schlacter 1990; Ostrom and Iacobucci 1995). Previous research indicates that high uncertainty and low confidence in judgment are linked to sustained and increased information search efforts, as well as more thorough and systematic processing of available information (Clarkson, Tormala, and Rucker 2008; Grant and Tybout 2008; Tiedens and Linton 2001; Urbany, Dickson, and Wilkie 1989). To the extent that services are associated with greater uncertainty and hence demand more cognitive resource to evaluate than would products, it seems likely that consumers would focus more on nonalignable attributes when evaluating services than when evaluating products, especially in the case of credence services. Thus, we predict that consumers’ relative weighting of alignable versus nonalignable attributes would differ as a function of the type of services they are evaluating.

According to the heuristic-systematic dual model of persuasion (Chaiken, Liberman, and Eagly 1989; Chaiken and Maheswaran 1994; Trope and Chaiken 1999), confidence is a fundamental driver of processing efforts in decision making. When consumers feel they are not as confident in their judgment as they should be, they are motivated to engage in increased and sustained information search to reduce the uncertainty and will continue to search for and process information until the desired level of confidence, referred to as the sufficiency threshold, is attained (Grant and Tybout 2008; Tiedens and Linton 2001). Hence, the higher levels of uncertainty associated with credence services should prompt people to expend more efforts when evaluating credence service options. Prior research shows that people tend to focus more on alignable than nonalignable attributes because alignable attributes are easier to process, but they focus more on nonalignable attributes when they expend cognitive resources on the decision-making task (Kivetz and Simonson 2000; Zhang and Fitzsimons 1999; Zhang and Markman 2001). Thus, we predict that people would focus on nonalignable attributes when choosing between credence services, the processing and evaluation of which require more efforts than when choosing between experience services.

There are reasons to support the notion that people pay more attention to nonalignable versus alignable attributes when they expend more efforts. First, people are strategic in their allocation of cognitive resources in that they pay more attention to important and relevant information. When presented with multiple alternatives, people pay more attention to attributes that differentiate between the various options than those that are common across options (Markman and Medin 1995). While alignable differences may be easier to process, nonalignable differences may be perceived to be more differentiating (Nam, Wang, and Lee 2012, in this issue) and hence would warrant more attention when consumers are motivated to process information. Further, it has been suggested that the relative weight of an attribute increases (decreases) as uncertainty heightens if the attribute is viewed as preserving (enhancing) the expected level of utility of the option (Kahn and Meyer 1991). To the extent that nonalignable attributes are unique to an option and hence more likely to be perceived as “preserving” attributes that represent an integral part of the option, nonalignable attributes of credence services would be perceived as more important than those of experience services. Thus, people are likely to focus more on nonalignable attributes when evaluating credence services. More formally, we hypothesize that:

**H1:** Consumers make greater use of alignable versus nonalignable attributes when comparing experience services.

**H2:** Consumers make greater use of nonalignable versus alignable attributes when comparing credence services.

Our view is that consumers rely more on nonalignable attributes when evaluating credence services because decisions that involve greater uncertainties warrant more attention. Uncertainty is generally considered to be a dynamic state of discomfort that exists when people feel they cannot
predict what will happen (Grant and Tybout 2008). In a consumption context, uncertainty often results from a lack of information or knowledge concerning the outcome of a purchase situation (Urbany et al. 1989) and may be manifested in terms of a lack of consumer confidence in their ability to evaluate the outcome of the service. When consumers feel uncertain, they will continue to search for and process information until they attain the sufficiency threshold (Chaiken and Maheswaran 1994; Trope and Chaiken 1999). Under these circumstances, ease of processing is no longer an important criterion for them to direct their attention and cognitive efforts; they may instead focus on the more differentiating nonalignable attributes. Accordingly, we predict that the greater uncertainty associated with credence (vs. experience) services underlies the differential weighting of nonalignable (vs. alignable) attributes in the evaluation of the services. And the notion that the perceived importance of nonalignable attributes may increase as uncertainty heightens (Kahn and Meyer 1991) further lends support to the mediating role of uncertainty in the processing of nonalignable attributes. More formally, we hypothesize that:

**H3:** The weighting of nonalignable (vs. alignable) attributes by consumers when evaluating credence (vs. experience) services is driven by the uncertainty related to the assessment of the services.

We tested these hypotheses in three studies by examining how people compare between an option that boasts superior alignable differences and another that showcases superior nonalignable differences when evaluating different experience and credence service options. Participants’ preference for the options would allow us to infer their relative weighting of alignable versus nonalignable attributes. But first, we reported the results of two pilot studies that examined the effect of alignability on the perceived differentiability and importance of the two types of attributes.

**PILOT STUDIES**

Our hypothesis that people would focus more on nonalignable attributes under uncertainty rests on the assumption that nonalignable attributes are considered to be more differentiating and more important than alignable attributes, even though they may be more difficult to process and understand. We conducted two pilot studies to ascertain the difference between alignable and nonalignable attributes in terms of their differentiating and importance characteristics. Our prediction is that nonalignable attributes are perceived to be more differentiating and more important than alignable attributes, especially when consumers are evaluating credence services.

**Method**

*Stimuli Development.* Thirty-two students similar in profile to those in the main studies were asked to classify eight services (i.e., restaurants, physicians, hotels, career development agencies, airlines, dentists, hair salons, and financial investment companies) into experience and credence services in a pretest. Over 80% of the participants classified restaurants as an experience service, while 78% categorized physicians as a credence service, consistent with prior findings (Ostrom and Iacobucci 1995). Thus, restaurants and physicians were selected to represent experience and credence services, respectively.

To develop the target profiles for the two services, we first generated two lists of 16 attributes, each representing a range of properties that restaurants and physicians might possess. Another 23 participants in a second pretest were presented with these lists of attributes and were asked to indicate how important it would be for a restaurant or a physician to possess each attribute (1 = not at all important; 7 = very important). Based on the results, we selected nine attributes for each of the two services that had similar importance ratings. The nine attributes were then randomly divided into three blocks of three attributes each (B1, B2, and B3). Importance ratings did not differ across the three blocks of restaurant attributes ($M_1 = 6.10$ vs. $M_2 = 6.29$ vs. $M_3 = 6.30$; $F(2, 66) = .48, p > .60$), nor across the three blocks of physician attributes ($M_1 = 5.97$ vs. $M_2 = 6.12$ vs. $M_3 = 6.16$; $F(2, 66) = .29, p > .70$).

We created two service options (A and B) for each service type using the three blocks of attributes: one block made up the nonalignable attributes for brand A, a second block comprised the nonalignable attributes for brand B, and the third block was the basis for the alignable attributes for the two brands. The assignment of the three blocks of attributes across the two brands was determined using a Latin Square Design (see tables A1 and A2 for details of the brand profiles). For both types of services (restaurants and physicians), brand A was superior to brand B on the alignable attributes (i.e., A was the superior-alignable brand), while brand B outperformed brand A on the nonalignable attributes (i.e., B was the superior-nonalignable brand).

**Experimental Design.** We used a 2 (service type: restaurants vs. physicians) × 2 (brand: superior-alignable vs. superior-nonalignable) mixed design in the pilot study, with brand as a within-participant factor. The assignment of the two brands was determined by a Latin Square Design to rotate all the attributes. The attribute information of the two brands was presented in two columns. We also counterbalanced the presentation order of the attributes such that an alignable and a nonalignable attribute appeared at the top of the list with equal frequency.

**Participants and Procedure.** A total of 300 participants were randomly assigned to the experimental conditions. After reviewing information on the two brands, participants were asked to identify the one attribute from the service descriptions that best differentiated between the two brands. Then they were asked to rank the six attributes of each brand in the order of importance by placing a number in front of each attribute, with 1 being the most important and 6 being
the least important. Thus, the smaller the number, the more important was the attribute.

Results and Discussion

Differentiability. Across all participants, a nonalignable attribute was identified as the most differentiating attribute between the two brands more often than an alignable attribute was (189 vs. 111; $\chi^2(1) = 20.28, p < .001$), and whether they were reviewing experience or credence service options did not make a difference ($\chi^2 < 1, p > .80$).

Importance Ranking. Next, we examined the importance ranking of the attributes across the four brands. As predicted, a nonalignable attribute was more likely to be identified as the most important attribute than an alignable attribute (72% vs. 28%), which is significantly different from the 50-50 chance probability ($\chi^2(1) = 71.39, p < .001$). Separate analyses for each of the four brands showed that a nonalignable attribute was identified more often as the most important attribute for the superior-alignable credence brand (74%; $\chi^2(1) = 35.77, p < .001$), the superior-nonalignable credence brand (82%; $\chi^2(1) = 60.57, p < .001$), the superior-alignable experience brand (68%; $\chi^2(1) = 18.60, p < .001$), as well as for the superior-nonalignable experience brand (72%; $\chi^2(1) = 29.73, p < .001$).

Next, we conducted separate exploded logit regressions on the attribute-ranking data of the four brands to further examine the effect of attribute type on the perceived importance of the attribute, with attribute type coded as 1 = nonalignable, 0 = alignable (Chapman and Staelin 1982). The result showed that the coefficient of attribute type was negative and significant ($\beta = -.45; z = -5.27, p < .001$) for the superior-alignable credence service, suggesting that nonalignable attributes are perceived to be more important than alignable attributes. Similar results were obtained for the superior-nonalignable credence service ($\beta = -.81; z = -2.92, p < .001$), the superior-alignable experience service ($\beta = -.15; z = -1.64, p = .066$), and the superior-nonalignable experience service ($\beta = -.51; z = -6.08, p < .001$). Taken together, these results provide evidence that nonalignable attributes are considered to be more differentiating and more important than alignable attributes.

Because participants first rated the differentiability of the attributes and then rank-ordered the attributes, it is possible that their importance rankings were influenced by their differentiability ratings. To rule out this alternative account for the importance data, we conducted another pilot study in which 193 participants were asked to simply rank-order the attributes without evaluating the attributes on differentiability. Replicating earlier results, a nonalignable attribute was more likely to be selected as the most important attribute than an alignable attribute across the four brands (72% vs. 28%), which is significantly different from the 50-50 chance probability ($\chi^2(1) = 71.30, p < .001$). Separate analyses for each of the four brands showed that a nonalignable attribute was identified more often as the most important attribute for the superior-alignable credence brand (76%; $\chi^2(1) = 24.51, p < .001$), the superior-nonalignable credence brand (79%; $\chi^2(1) = 31.02, p < .001$), the superior-alignable experience brand (68%; $\chi^2(1) = 5.34, p < .05$), and the superior-nonalignable experience brand (71%; $\chi^2(1) = 16.98, p < .001$). Replicating our earlier results, exploded logit regressions (Chapman and Staelin 1982) showed that the coefficient of attribute type was negative and significant for the superior-alignable credence service ($\beta = -.60; z = -5.56, p < .001$), the superior-nonalignable credence service ($\beta = -.68; z = -6.37, p < .001$), the superior-alignable experience service ($\beta = -.25; z = -2.44, p < .02$), and the superior-nonalignable experience service ($\beta = -.51; z = -6.08, p < .001$), providing further evidence that participants perceived nonalignable attributes to be more important than alignable attributes.

These results show that consumers recognize the distinctive and important nature of nonalignable attributes relative to alignable attributes, even though they may not use them in their brand choice decisions. The findings provide the basis for our hypothesis that people would shift their attention to the more important nonalignable attributes when they engage in more elaborate processing under conditions of high uncertainty.

STUDY 1

The objective of study 1 was to seek initial support for our hypotheses that consumers rely on alignable and nonalignable attributes to varying degrees when evaluating experience versus credence services. Specifically, consumers are more likely to rely on alignable than on nonalignable attributes when they evaluate experience services; however, the greater uncertainties associated with credence services should prompt a shift in their weighting toward nonalignable attributes. Thus, our prediction was that consumers would be more confident when evaluating the experience services than the credence services and that consumers would be more favorable toward the brand that is superior on alignable attributes when evaluating experience services, but would prefer the brand that is superior on nonalignable attributes when evaluating credence services.

Method

Experimental Design. The experiment used a 2 (service type: restaurants vs. physicians) × 2 (brand: superior-alignable brand A vs. superior-nonalignable brand B) mixed design, with brand being a within-participant factor. The brand stimuli were the same as in the pilot studies, with restaurants and physicians selected to represent experience and credence services, respectively. The assignment of the three blocks of attributes across the two brands was determined using a Latin Square Design, and the left-right presentation order of the two brands was counterbalanced. This design implied that any difference in preference observed between the superior-alignable brand and the superior-nonalignable brand could not be attributed to the idiosyncratic differences of the individual attributes, or in the overall importance of the
attributes. Rather, participants’ preference for one brand over the other could be unambiguously attributed to whether they were focusing on the alignable or nonalignable differences when evaluating the two options. The key dependent measures were purchase likelihood, attitude confidence, and thought listing.

**Participants and Procedure.** A total of 173 university students (mean age = 25.33; 87 females) were randomly assigned to each of the experimental conditions. Participants received a booklet containing the attribute descriptions of either two restaurants or two physicians. They were asked to read the information about the two brands carefully and to indicate their purchase likelihood for each of the two brands on a 7-point scale (1 = not at all likely to buy; 7 = highly likely to buy). To gain insight into how participants evaluated different types of services, we asked participants to write down what they were thinking while evaluating the services. Participants then indicated, using 7-point scales, how confident they felt about their decision (1 = not at all confident, not at all certain; 7 = extremely confident, extremely certain), how familiar they were with the service (1 = very unfamiliar, know very little, have no idea; 7 = very familiar, know a lot, have clear idea), and how attractive each attribute was (1 = extremely unattractive; 7 = extremely attractive).

**Results**

**Manipulations Checks.** The construction of the brands based on their attribute attractiveness was found to be appropriate. Specifically, participants rated restaurant A’s alignable attributes to be more attractive than those of restaurant B ($M_A = 5.62$ vs. $M_B = 3.98$; $t(86) = 9.70$, $p < .001$), but they perceived the nonalignable attributes of restaurant B to be more attractive than those of restaurant A ($M_B = 5.70$ vs. $M_A = 3.59$; $t(86) = 11.19$, $p < .001$). Similarly, participants rated physician A’s alignable attributes to be more attractive than those of physician B ($M_A = 5.78$ vs. $M_B = 3.28$; $t(85) = 14.22$, $p < .001$), but they rated the nonalignable attributes of physician B to be more attractive than those of physician A ($M_B = 5.98$ vs. $M_A = 3.35$; $t(85) = 13.50$, $p < .001$).

Next, we examined whether the task of evaluating credential services was associated with more uncertainty than the task of evaluating experience services. The two confidence items were averaged to form a confidence index for each of the two services ($\alpha_{rest} = .84$, $\alpha_{phys} = .90$). As expected, participants evaluating the credential services were less confident in their judgment than those evaluating experience services ($M_{rest} = 5.78$ vs. $M_{phys} = 4.80$; $F(1, 171) = 32.69$, $p < .001$).

**Purchase Likelihood.** We used a 2 (service type) × 2 (brand) mixed-design ANOVA to analyze participants’ purchase likelihood ratings, with brand as a within-participant factor. The results showed that neither the main effect of brand ($F(1, 171) = 2.21$, $p > .10$) nor service type ($F(1, 171) = 2.94$, $p > .10$) was significant. Importantly, the expected service type × brand interaction effect was significant ($F(1, 171) = 123.46$, $p < .001$; see fig. 1A).

Planned contrasts showed that participants were more likely to patronize the superior-alignable restaurant A than the superior-nonalignable restaurant B ($M_A = 5.24$ vs. $M_B = 3.42$; $t(86) = 10.61$, $p < .001$). However, they indicated a greater likelihood to consult physician B than to consult physician A ($M_A = 3.98$ vs. $M_B = 4.98$; $t(85) = -5.34$, $p < .001$). These results suggest that they relied more on alignable attributes when choosing between the two restaurants, confirming hypothesis 1, but relied more on nonalignable attributes when choosing between the two physicians, providing support for hypothesis 2.

**Thought Listing.** Responses in the thought-listing task were coded into three mutually exclusive categories by two independent raters who were blind to the hypotheses. These categories were: (a) alignable differences (e.g., “the price is lower in restaurant A than in restaurant B”), (b) nonalignable differences (e.g., “restaurant B offers a smoking area”), and (c) neither (e.g., “I did not notice any difference”). Overall, the interrater reliability was .91, and differences between the raters were resolved through discussion. The thought-listing data provided further support for our hypotheses. A 2 (service type) × 2 (attribute type) mixed-design ANOVA with attribute type as a within-participant factor showed that the effect of attribute type ($F(1, 171) = 3.51$, $p < .10$) was nonsignificant. Central to this research, the main effect of service type ($F(1, 171) = 12.69$, $p < .001$) was qualified by the two-way interaction ($F(1, 171) = 91.74$, $p < .001$; see fig. 1B). Consistent with hypothesis 1, participants mentioned more alignable than nonalignable differences when evaluating the two restaurants ($M_{align} = 2.09$ vs. $M_{nonalign} = 1.16$; $t(86) = 7.07$, $p < .001$). In contrast, they listed more nonalignable than alignable differences when evaluating the physicians ($M_{align} = 2.70$ vs. $M_{nonalign} = 1.31$; $t(85) = 6.80$, $p < .001$), providing support for hypothesis 2.

Our prediction was that participants’ lack of confidence while evaluating credential services would shift their focus to nonalignable attributes. Indeed, separate regression analyses showed that the more confident participants were in their judgment, the more alignable thoughts they listed ($\beta = .14$, $t(171) = 2.32$, $p = .02$), and the less confident they were in their judgment, the more nonalignable thoughts they listed ($\beta = -.38$, $t(171) = -4.60$, $p < .001$).

**Mediation Analysis.** We hypothesized that the increased focus on nonalignable attributes when evaluating credential (vs. experience) services was driven by the increased level of uncertainty associated with credential services. To test this, we created a relative purchase likelihood index by dividing participants’ purchase likelihood rating of the superior-alignable brand by their rating of the superior-nonalignable brand. Service type was coded as a dummy variable (1 = credential service; 0 = experience service). Bootstrapping analyses (Preacher and Hayes 2004; Zhao, Lynch, and Chen 2010)
showed that while the direct effect of service type remained significant (−.73, \( p < .001 \)), the indirect effect of confidence on the purchase likelihood index was negative and significant (−.14, lower 95% CI = −.31, upper 95% CI = −.05). These results present evidence that the effect of service type on purchase likelihood was partially mediated by attitude confidence, providing support for hypothesis 3.

Our hypothesis was that participants’ lack of confidence when evaluating credence services prompted them to pay more attention to nonalignable attributes; hence, they preferred the nonalignable-superior physician B to the alignable-superior physician A. To examine how participants’ elaboration of the attributes as driven by attitude uncertainty may influence purchase likelihood, we first created a relative thought index by dividing participants’ alignable thought listings by their nonalignable thought listings. Service type was coded as a dummy variable (1 = credence service; 0 = experience service). Bootstrapping analyses revealed a significant direct effect of service type (−.39, \( p < .001 \)) as well as a significant indirect effect of thought listing (−.24, lower 95% CI = −.37, upper 95% CI = −.14), providing evidence for partial mediation. These results suggest that the greater uncertainty associated with credence services prompted participants to elaborate more on the nonalignable attributes of the physicians and in turn influenced their purchase likelihood.

Discussion

Study 1 showed that participants weighted alignable versus nonalignable attributes differently when evaluating experience versus credence services. They favored the superior-alignable over the superior-nonalignable experience service but preferred the superior-nonalignable to the su-
perior-alignable credence service. Their confidence ratings and thought-listing data provided evidence that participants’ lack of confidence when evaluating credence services led to their greater elaboration of and reliance on nonalignable attributes when comparing the two credence service options. Consistent with prior findings, participants relied on alignable attributes when evaluating the two experience service options, but they focused more on nonalignable attributes when evaluating the two credence service options. In this study, each attribute was an alignable and a nonalignable attribute for brand A and brand B an equal number of times. The Latin Square Design helped to rule out the potential alternative explanation based on stimulus-specific characteristics. Rather, participants’ purchase likelihood ratings reflected the types of attributes they focused on, as a function of their confidence in their evaluation of the experience versus credence services.

To test the robustness of the effect of service type on how people process brand information, we replicated the findings in another study using hotels and dentists to represent experience and credence services, respectively. In particular, participants preferred the alignable-superior hotel (M_A = 4.55 vs. M_B = 3.80; t(91) = 8.95, p < .001) but the nonalignable-superior dentist (M_A = 5.20 vs. M_B = 4.15; t(90) = 9.15, p < .001). Bootstrapping analyses again showed a significant direct effect of service type (β = .36, p < .001) and a significant indirect effect of confidence (β = -.04; lower 95% CI = -.07, upper 95% CI = -.01), providing evidence that participants’ confidence in their judgment partially mediated the effect of service type.

While study 1 provided preliminary evidence for the role of uncertainty in the weighting of alignable versus nonalignable attributes, one limitation of these results was that confidence was a measured variable; hence, the inferred relationship between confidence and the weighting of alignable versus nonalignable attributes was correlational in nature. To provide more unambiguous evidence of the influence of confidence on brand evaluation, we systematically varied uncertainty to observe its effect on consumers’ reliance on alignable versus nonalignable attributes in the next two studies.

**STUDY 2**

In study 1, we showed that participants shifted their attention from alignable attributes to nonalignable attributes when they felt less certain about their judgment. Uncertainty was operationalized using service type—with credence service being associated with greater uncertainty than experience service. Study 2 was designed to more directly examine the role of uncertainty in people’s reliance on nonalignable versus alignable attributes when evaluating different service options. When uncertainty is low, consumers would likely not expend much resource on their purchase decision and hence should focus more on alignable (vs. nonalignable) attributes. However, when uncertainty is high, consumers should be more motivated to expend cognitive resource to evaluate the options and hence would focus on nonalignable (vs. alignable) attributes. These predictions should hold regardless of whether their decision involves experience or credence services. To test this hypothesis, we manipulated uncertainty in study 2 by presenting participants with experience versus credence service options as in study 1 as well as by varying the ambiguity of brand information.

**Method**

**Stimuli Development.** Based on the pretest results described in the pilot study, we selected hair salons (classified by 80% of the respondents as an experience service) and career development agencies (classified by 78% of the respondents as a credence service) as the target experience and credence services, respectively. In another pretest, 32 participants with the same profile as those in the main study were presented with a range of properties that hair salons and career development agencies might possess and were asked to indicate how important it would be for a hair salon or a career development agency to possess each of the attributes (1 = not at all important; 7 = very important). Based on these results, we selected nine attributes for each of the two services and then randomly divided the attributes into three blocks of three attributes each. Importance ratings did not differ across the three blocks of hair salon attributes (M_A = 6.21 vs. M_B = 6.06 vs. M_C = 6.37; F(2, 62) = .95, p > .30), nor did they differ across the three blocks of career development agency attributes (M_A = 6.53 vs. M_B = 6.44 vs. M_C = 6.44; F(2, 62) = .38, p > .60).

We then created two brands of hair salon and two brands of career development agency by randomly assigning the three blocks of attributes to create alignable and nonalignable attributes for the two brands such that one brand is superior to the other brand along its alignable attributes but inferior along its nonalignable attributes. We pretested these brands by asking four independent groups of participants to provide overall attractiveness ratings for the four brands (two hair salons and two career development agencies) using a 7-point scale (1 = extremely unattractive; 7 = extremely attractive). The results showed no difference in attractiveness between the two hair salons (M_A = 4.60 vs. M_B = 4.62; t(29) = -.19, p > .80), or between the two career development agencies (M_A = 4.84 vs. M_B = 5.04; t(29) = -1.42, p > .10). The detailed brand stimuli are in table A3.

**Experimental Design.** We used a 2 (service type: hair salon vs. career development agency) × 2 (uncertainty: low vs. high) between-participants design. The key dependent measure was brand preference.

**Participants and Procedure.** We recruited 241 undergraduate students (mean age = 20.46; 150 females) to participate in the study. They were randomly assigned to each of the four conditions and followed a similar procedure as in study 1. Participants were first presented with information about the two service options, followed by 10 readers’ reviews of the two options. Specifically, participants in the
Results

Manipulation Checks. We first examined the attractiveness ratings for the two types of attributes. As expected, participants perceived the alignable attributes of hair salon A to be more attractive than those of hair salon B (M_A = 5.87 vs. M_B = 3.88; t(119) = 20.69, p < .001), but the nonalignable attributes of hair salon B were more attractive than those of hair salon A (M_B = 5.39 vs. M_A = 3.88; t(119) = 19.49, p < .001). Similarly, they rated the alignable attributes of career development agency A to be more attractive than those of agency B (M_A = 5.77 vs. M_B = 3.95; t(120) = 16.21, p < .001), but agency B’s nonalignable attributes to be more attractive than those of agency A (M_B = 5.96 vs. M_A = 3.73; t(120) = 11.10, p < .001). In addition, the overall attribute attractiveness ratings between hair salon A and hair salon B (M_A = 4.62 vs. M_B = 4.63; t(119) = −.15, p > .80) and between agency A and agency B (M_A = 4.75 vs. M_B = 4.95; t(120) = 1.39, p > .10) did not differ.

Participants’ responses to the attitude confidence items were examined next. A 2 (service type) × 2 (uncertainty) ANOVA on participants’ confidence index (α_salon = .82, α_agenc = .75) revealed the predicted effect of service type (F(1,237) = 4.44, p < .05) such that participants were more confident when evaluating experience service than credence service options (M_exp = 5.13 vs. M_red = 4.84). The effect of uncertainty was also significant (F(1,237) = 15.75, p < .001) such that participants expressed significantly lower confidence in the high-uncertainty condition than in the low-uncertainty condition (M_high = 4.71 vs. M_low = 5.25), indicating that our manipulation of uncertainty was successful. The interaction was not significant (F(1,237) = 1.54, p > .20).

Brand Preference. To gain insight into how participants evaluated the different service options, we conducted a 2 (service type) × 2 (uncertainty) ANOVA on the number of points participants allocated to the superior-nonalignable brand. The results showed that the interaction between service type and uncertainty was not significant (F < 1). However, as predicted, the main effects of service type (F(1, 237) = 100.18, p < .001) and uncertainty (F(1, 236) = 29.38, p < .001) were both significant. Participants allocated more points to the superior-nonalignable brand when they were evaluating the credence services (M_B = 59.82) than when they were evaluating the experience services (M_A = 45.21). Participants also allocated more points to the superior-nonalignable brand under high than low uncertainty (M_high = 56.50 vs. M_low = 48.55). Subsequent analyses conducted for each service type showed that for experience services, the number of points allocated to the superior-alignable brand was significantly above the 50-50 split baseline (M_A = 58.82; t(59) = 6.28, p < .001) when uncertainty was low; however, when uncertainty was high, their allocation of points between the two brands were not significantly different from an even split of 50-50 (M_A = 51.68; t < 1; see fig. 2A). For the credence services, participants allocated more points to the superior-nonalignable option even when uncertainty was low (M_B = 55.92; t(59) = 3.32, p < .005), and their preference for the superior-nonalignable option was accentuated when uncertainty was high (M_B = 63.66; t(60) = 13.02, p < .001). From a slightly different perspective, participants evaluated the superior-nonalignable credence service much more favorably when uncertainty was high (M_high = 63.66) than low (M_low = 55.92; F(1, 119) = 14.14, p < .001; see fig. 2B). Taken together, these data provided convergent evidence in support for hypothesis 3 that uncertainty underlies the weighting of alignable versus nonalignable attributes in consumer decision making.

Discussion

In this study, participants were presented with exactly the same attribute information on the two options across the two uncertainty conditions, and yet their judgment shifted in favor of the superior-nonalignable option when they received ambivalent reviews about the service options. By systematically manipulating uncertainty, this study offers more direct evidence that uncertainty leads to greater reliance on nonalignable attributes than on alignable attributes in service evaluation. Study 1 showed that participants focused more on alignable attributes when evaluating experience services, but they focused more on nonalignable attributes when evaluating credence services that are associated with a higher degree of uncertainty. The results of study 2 showed that consumers would focus on nonalignable attributes even for experience services when they lack confidence in their evaluation.

In study 2, uncertainty was manipulated by varying the information related to the decision task, while keeping information on the brands constant. To garner more confidence in the causal effect of uncertainty in the relative weighting of alignable and nonalignable attributes in the evaluation of services, we manipulated uncertainty using a different operationalization in the next study, while keeping all information related to the decision task invariant.

STUDY 3

We demonstrated the effect of uncertainty on the weighting of alignable versus nonalignable attributes in study 2 by varying the ambiguity of the readers’ review information.
To further test the robustness of our hypothesis, we used an internal, metacognitive manipulation of uncertainty in study 3, while keeping information about the services constant. More specifically, we manipulated uncertainty by priming participants with confidence or doubt, as per Clarkson et al. (2008), before presenting them with information about the services. And to further examine the causal role of uncertainty, participants were asked to list the information they considered most important in forming their evaluations. While the study was self-paced, participants were not permitted to backtrack. We used hotels and dentists to represent experience and credence services, respectively.

Method

Stimuli Development. As in study 2, we selected nine attributes for each of the two services and then randomly divided them into three blocks of three attributes each. The results of a pretest showed that the three blocks of hotel attributes ($M_1 = 6.00$ vs. $M_2 = 6.15$ vs. $M_3 = 6.00$; $F(2, 62) = .27, p > .70$) and dentist attributes ($M_1 = 6.19$ vs. $M_2 = 6.16$ vs. $M_3 = 6.16$; $F(2, 62) = .03, p > .90$) did not differ on their importance ratings. We then created two hotel options and two dentist options such that one option is superior to the other option along its alignable attributes but inferior along its nonalignable attributes. Pretest results further showed that the two hotels did not differ in overall attractiveness ($M_A = 4.72$ vs. $M_B = 4.94$; $F(1, 34) = 1.06, p > .30$), nor did the two dentists ($M_A = 4.81$ vs. $M_B = 5.03$; $F(1, 34) = 1.88, p > .20$). Thus, any difference in preference between the superior-alignable brand and the superior-nonalignable brand could not be attributed to the attractiveness of the brands. The brand stimuli details are in the table A4.

Experimental Design. We used a 2 (service type: hotels vs. dentists) × 2 (uncertainty: high vs. low) × 2 (brand: superior-alignable vs. superior-nonalignable) mixed design,
with brand being a within-participant factor. The key dependent measures were brand evaluation and thought listing.

**Participants and Procedure.** We recruited 195 undergraduate students (mean age = 20.53; 99 females) to participate in the study. They were randomly assigned to each of the four experimental conditions.

To induce different levels of uncertainty, all participants were asked to recall five personal experiences in which they felt either confident or doubtful. More specifically, they were given the following instructions: “We would like you to list five experiences you have had in which you felt a great deal of confidence or certainty (doubt or uncertainty). These experiences could reflect confidence (doubt) in thoughts you have had, confidence (doubt) in decisions or predictions you’ve made, or even confidence (doubt) in your general ability to do something. In each of the five boxes that appear next, please describe a different experience in which you felt highly confident (doubtful) about something.” Upon completion of this task, participants were presented with the descriptions of either two hotels or two dentists. Participants reported their evaluations for the two brands, attitude confidence index, and confidence (doubt) in decisions or predictions they had, confidence (doubt) in the service-type interaction (1985). The results showed that for the experience services, low-uncertainty participants preferred the superior-alignable alternative (\(M_A = 5.35\) vs. \(M_B = 4.42\); \(F(1, 47) = 77.19, p < .001\); see fig. 3A), replicating prior research, whereas high-uncertainty participants did not evaluate the superior-alignable and superior-nonalignable experience brands differently (\(M_A = 4.93\) vs. \(M_B = 4.77; F(1, p < .30)\). From a slightly different perspective, participants evaluated the superior-alignable experience alternative more favorably in the low-uncertainty condition (\(M_{low} = 5.35\) vs. \(M_{high} = 4.93; F(1, 94) = 6.38, p < .05\)).

**Results**

**Manipulation Checks.** We first examined participants’ attractiveness ratings for the different types of attributes. Participants perceived the alignable attributes of hotel A to be more attractive than those of hotel B (\(M_A = 6.13\) vs. \(M_B = 3.98; t(95) = 17.89, p < .001\)). In contrast, they perceived the nonalignable attributes of hotel B to be more attractive than those of hotel A (\(M_A = 5.26\) vs. \(M_B = 3.11; t(95) = 14.59, p < .001\)). Similarly, they rated the alignable attributes of dentist A to be more attractive than those of dentist B (\(M_A = 5.54\) vs. \(M_B = 4.13; t(98) = 14.86, p < .001\)), and dentist B’s nonalignable attributes to be more attractive than those of dentist A (\(M_A = 4.59\) vs. \(M_B = 2.95; t(98) = 11.71, p < .001\)). In addition, the overall attribute attractiveness ratings between hotel A and hotel B (\(M_A = 4.72\) vs. \(M_B = 4.62; t(95) = 1.37, p > .10\)) and between dentist A and dentist B (\(M_A = 4.24\) vs. \(M_B = 4.36; t(98) = -1.48, p > .10\)) did not differ. We next submitted participants’ attitude confidence index (\(\alpha_{hotel} = .96, \alpha_{dentist} = .92\)) to a 2 (service type) \(\times 2\) (uncertainty) ANOVA. As expected, there was a significant main effect of uncertainty (\(F(1, 191) = 10.31, p < .01\)) such that participants in the low-uncertainty condition reported higher confidence than those in the high-uncertainty condition (\(M_{low} = 5.78\) vs. \(M_{high} = 5.30\)). No other effects were significant (all \(F < 1\)).

**Brand Evaluation.** The brand evaluation results replicated those of study 2 (\(\alpha_{hotel} = .75, \alpha_{dentist} = .86\)). Results of a 2 (service type) \(\times 2\) (uncertainty) \(\times 2\) (brand) mixed-design ANOVA showed that none of the main effects were significant (all \(F < 1\)). However, the predicted brand \(\times\) service-type interaction (\(F(1, 191) = 101.03, p < .001\)) as well as the brand \(\times\) uncertainty interaction (\(F(1, 191) = 29.94, p < .001\)) were both significant. Follow-up contrasts showed that participants in the experience service condition had more favorable attitudes toward the superior-alignable brand (\(M_A = 5.14\) vs. \(M_B = 4.59; F(1, 95) = 22.15, p < .001\)), whereas those in the credence service condition had more favorable attitudes toward the superior-nonalignable brand (\(M_A = 4.33\) vs. \(M_B = 5.16; F(1, 98) = 82.72, p < .001\)). Also as expected, participants in the low-uncertainty condition evaluated the superior-alignable brand more favorably than the superior-nonalignable brand (\(M_A = 4.93\) vs. \(M_B = 4.68; F(1, 95) = 4.08, p < .05\)), whereas the reverse pattern was found in the high-uncertainty condition (\(M_A = 4.54\) vs. \(M_B = 5.07; F(1, 98) = 19.39, p < .001\)).

Although the three-way interaction was not significant (\(F < 1\)), we examined participants’ evaluations of the two options in each of the service type \(\times\) uncertainty condition to gain a clearer picture of the data (Rosenthal and Rosnow 1985). The results showed that for the experience services, low-uncertainty participants preferred the superior-alignable alternative (\(M_A = 5.35\) vs. \(M_B = 4.42; F(1, 47) = 77.19, p < .001\); see fig. 3A), replicating prior research, whereas high-uncertainty participants did not evaluate the superior-alignable and superior-nonalignable experience brands differently (\(M_A = 4.93\) vs. \(M_B = 4.77; F(1, p < .30)\). From a slightly different perspective, participants evaluated the superior-alignable experience alternative more favorably in the low-uncertainty condition (\(M_{low} = 5.35\) vs. \(M_{high} = 4.93; F(1, 94) = 6.38, p < .05\)).

From the slightly different perspective, participants evaluated the superior-alignable experience alternative more favorably in the low-uncertainty condition (\(M_{low} = 4.77\) vs. \(M_{high} = 4.42; F(1, 94) = 5.65, p < .05\)). For the credence services, the main effect of brand (\(F(1, 97) = 8.52, p < .01\)) was qualified by a significant brand \(\times\) uncertainty interaction (\(F(1, 97) = 19.81, p < .001\)). While participants preferred the superior-nonalignable credence brand to the superior-alignable credence brand across both uncertainty conditions, this preference was greater in the high-uncertainty condition (\(M_A = 4.36\) vs. \(M_B = 4.17, difference = 1.19; F(1, 50) = 293.60, p < .001\)) than in the low-uncertainty condition (\(M_A = 4.95\) vs. \(M_B = 4.49, difference = .46; F(1, 47) = 9.17, p < .01; see fig. 3B\)). From a slightly different perspective, participants evaluated the superior-nonalignable credence alternative more favorably in the low-uncertainty condition (\(M_{low} = 4.95\) vs. \(M_{high} = 4.49; F(1, 97) = 6.19, p < .05\)), whereas they were more positive toward the superior-alignable credence alternative in the high-uncertainty condition (\(M_{low} = 4.49\) vs. \(M_{high} = 4.17; F(1, 97) = 5.54, p < .05\)). Thus, hypothesis 3 was further supported.

**Thought Listing.** Our prediction was that participants would rely more on alignable attributes when uncertainty was low but that they would rely more on nonalignable attributes when uncertainty was high. The information that participants listed as most important to them in forming their
evaluations was classified by two independent raters who were blind to the research objective and hypotheses into three categories: (a) alignable (e.g., “rating for the security personnel’s responsibility is higher in hotel A than in hotel B”), (b) nonalignable (e.g., “dentist B offers up-to-date equipment”), and (c) neither (e.g., “I am not very familiar with dental services”). Interrater agreement was 93%, and disagreements were resolved by discussion.

A 2 (service type) × 2 (uncertainty) × 2 (attribute type) mixed-design ANOVA with attribute type as a within-participant factor showed that the three-way interaction among service type, uncertainty, and attribute type was not significant ($F < 1$). As expected, the service type × attribute type interaction was significant ($F(1, 191) = 225.91, p < .001$) such that participants listed more alignable than nonalignable attributes in the experience service condition ($M_{align} = 1.94$ vs. $M_{nonalign} = 1.32; F(1, 95) = 31.68, p < .001$), but they listed more nonalignable than alignable attributes in the credence service condition ($M_{align} = 1.00$ vs. $M_{nonalign} = 2.33; F(1, 98) = 154.00, p < .001$). Also significant was the uncertainty × attribute type interaction ($F(1, 191) = 30.81, p < .001$). Whereas participants in the low-uncertainty condition listed an equal number of alignable and nonalignable attributes ($M_{align} = 1.68$ vs. $M_{nonalign} = 1.55; F(1, 95) = .69, p > .40$), those in the high-uncertainty condition listed more nonalignable than alignable attributes ($M_{nonalign} = 1.94$ vs. $M_{align} = 1.25; F(1, 98) = 23.2, p < .001$).

These thought-listing data offer further evidence that people pay more attention to and rely more on nonalignable than alignable attributes as the basis for their evaluation when uncertainty was high.

**GENERAL DISCUSSION**

The structural alignment model has been used to understand how consumers make comparisons between available...
alternatives. Past research provides overwhelming evidence that the comparability between options has a strong influence on individual decision making (Medin, Goldstone, and Markman 1995). In particular, people find nonalignable attributes more difficult to process and hence assign more weight to alignable attributes. The present research contributes to the structural alignment literature by showing that consumers will shift their attention to nonalignable attributes when they are uncertain about their judgment. Across three studies, using three different operationalizations of uncertainty—credence versus experience service types (study 1), the ambivalence of consumer reviews (study 2), and a self-doubt versus self-confidence prime (study 3)—the hypothesized effect of uncertainty on how participants process attribute information was consistently observed.

This research also contributes to the literature by deepening our understanding of the differences in consumer risk perception between products and services (Murray and Schlacter 1990) and its implication for consumer decision making. The intangibility of services with the associated uncertainty often renders services more difficult to assess than products, and this uncertainty-related difficulty is exacerbated in the case of credence services. The results of our pilot studies show that people perceive nonalignable versus alignable attributes as more differentiating and important between competing brands across both experience and credence services. However, they focus on nonalignable attributes as the basis of evaluation only for credence services, when their lack of confidence prompts them to expend resources to process the more difficult nonalignable attributes. Across three studies, we presented evidence that uncertainty related to credence services undermines consumers’ confidence and in turn influences their relative weighting of alignable versus nonalignable attributes when evaluating different service options. Specifically, the thought-listing data in study 1 provided evidence that consumers focused more on alignable attributes when evaluating experience services but on nonalignable attributes when evaluating credence services, which accounted for their preference for the superior-alignable experience service option and for the superior-nonalignable credence service option. A separate follow-up experiment of study 1 further corroborated our view that people perceive alignable (nonalignable) attributes to be more diagnostic when evaluating experience (credence) services. By counterbalancing the assignment of attributes as alignable and nonalignable using a Latin Square Design, we made sure that the effects observed were not due to the inherent attractiveness or importance of the specific attributes, but to their alignability across the two options. Results of the mediation analyses provided additional support that participants’ relative weighting of the nonalignable attributes was partially driven by consumers’ attitude confidence.

By directly manipulating uncertainty as part of the decision task in study 2 and as an incidental metacognitive experience outside the task in study 3, we presented clear evidence for our prediction that the higher level of uncertainty associated with credence (vs. experience) services underlies consumers’ reliance on nonalignable (vs. alignable) attributes. The information listing data in study 3 provided further support that consumers focus more on nonalignable (vs. alignable) attributes when they lack confidence in their judgment. Taken together, the results across the three studies provide new insights into the comparative decision-making process by showing that uncertainty affects the relative weighting of alignable versus nonalignable attributes in the construction of consumer preferences.

Beyond the theoretical contributions, the present research also offers important implications for managers in the service sector. In the face of intense competition and the challenges of understanding consumer decision making, marketers are on the constant lookout for ways to position their offerings to capture consumer attention and influence brand choice. Our findings suggest that managers should take attribute alignability and uncertainty into consideration when developing positioning and communication strategies, as consumers make comparisons between alternatives all the time, either with an explicit alternative (as in comparative advertising) or with an internal reference brand (Hsee and Zhang 2004). Thus, it pays for firms to identify the strengths on which they could compete more successfully.

Our findings point to the different ways that service providers can proactively create an environment to enhance the effectiveness and persuasiveness of promotion strategies. To the experience service provider, say a retail bank, we suggest that it builds on its alignable attributes, perhaps by providing longer operating hours or offering more competitive interest rates. If an experience service provider does not have a relative advantage in terms of alignable attributes, it should highlight the purchase uncertainty of the service, as high purchase uncertainty will blunt consumer attention toward the company’s weaknesses on the alignable attributes. As for the credence service provider such as an insurance company, the dominant strategy would be to create innovative and distinctive attributes, such as a personalized insurance consulting service or unique insurance products. For those credence service providers that do not have a dominant nonalignable attribute and are competing on alignable attributes, framing the service as a low-uncertainty purchase decision might render their offerings more attractive.

In the marketplace, many companies have benefited from investing in and leveraging the right kind of competitive advantage. For instance, in the airline industry, where business travelers can easily compare convenience and reliable service among different choices of airlines, Singapore Airlines has over the years invested a lot of their resources to build excellent service reliability (Reeves and Bednar 1994). And in courier services, where purchase uncertainty is typically high, Federal Express was the first company to create nonalignable attributes such as the provision of a tracking service so that consumers could use the Internet to locate a package and determine when it would arrive at the final destination (Laroche et al. 2005). Along these lines, many private hospitals are trying to win customers (i.e., attract patients) by highlighting special features such as cutting-
edge research or the most sophisticated equipment in their messages to differentiate themselves from their competitors.

We note that while current research presents clear evidence that consumers pay more attention to nonalignable attributes when uncertainty is high, nonalignability of the attributes was operationalized by presenting participants with unique attributes for both brands rather than by the use of missing information whereby participants are presented with attribute information only for one brand and received no mention of the attribute for the other brand (Zhang et al. 2002). It is possible that unique attributes are associated with greater levels of uncertainty than missing information; verification of the effects of service type on nonalignable attributes in the context of missing information awaits future research.

Another potentially fruitful avenue of research involves examining gender as a moderator of the relative weighting of alignable versus nonalignable differences. In particular, past research indicates that men are often less persuaded than women by ads containing complex information (Putrevu, Tan, and Lord 2004). Given that comparing nonalignable differences is a cognitively more complex task than comparing alignable attributes, it is possible that gender may also moderate the processing of alignable versus nonalignable attributes.

Finally, drawing on temporal construal theory, Malkoc, Zauberman, and Ulu (2005) suggest that when considering future events, individuals are more likely to construe a near future event in terms of specific features and focus on alignable attributes. Conversely, when considering an event in the distant future, individuals tend to construe the event more abstractly and focus on nonalignable attributes. The cross-cultural literature suggests that Western consumers are more present-oriented, whereas Eastern consumers tend to have a temporally distant perspective (Chen, Ng, and Rao 2005). Thus, it is plausible that cross-cultural differences may exist in the processing of the two types of attributes. A more systematic investigation of how members of different cultures process alignable versus nonalignable attributes may yield further insights into the consumer decision-making process.

In conclusion, it is interesting to note that while consumers may consider a nonalignable attribute to be more differentiating and more important, the cognitive miser in them would still base their product judgment and brand choice on alignable attributes. And yet when consumers feel uncertain about their decision, instead of focusing their attention on those alignable attributes that are easy to process and understand, they shift their attention to the nonalignable attributes that are more difficult to process and interpret. The implication is that people are strategic—they are cognitive misers only when they feel they could conserve cognitive resources and still make good decisions. They readily take on the more demanding task when good judgment may be at risk.

APPENDIX

TABLE A1
BRAND STIMULI FOR THE RESTAURANTS (PILOTS AND STUDY 1)

<table>
<thead>
<tr>
<th>Restaurant A</th>
<th>Restaurant B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First set</strong></td>
<td><strong>Second set</strong></td>
</tr>
<tr>
<td><strong>Alignable differences:</strong></td>
<td><strong>Nonalignable differences:</strong></td>
</tr>
<tr>
<td>Food with good quality</td>
<td>Food with moderate quality</td>
</tr>
<tr>
<td>Reasonable price</td>
<td>Expensive price</td>
</tr>
<tr>
<td>No billing error</td>
<td>Occasional billing error</td>
</tr>
<tr>
<td><strong>Nonalignable differences:</strong></td>
<td></td>
</tr>
<tr>
<td>Not all staff members are pleasant-looking</td>
<td>Always provides the right kind of food</td>
</tr>
<tr>
<td>Not consistently friendly reception</td>
<td>Clean and comfortable environment</td>
</tr>
<tr>
<td>Partitioned smoking area and charging extra fees</td>
<td>Prompt service</td>
</tr>
<tr>
<td><strong>Second set</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Alignable differences:</strong></td>
<td><strong>Nonalignable differences:</strong></td>
</tr>
<tr>
<td>Not always provide the right kind of food</td>
<td>Foods with good quality</td>
</tr>
<tr>
<td>Not consistently clean and comfortable environment</td>
<td>Reasonable price</td>
</tr>
<tr>
<td>Not very prompt service</td>
<td>No billing error</td>
</tr>
<tr>
<td><strong>Third set</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Alignable differences:</strong></td>
<td><strong>Nonalignable differences:</strong></td>
</tr>
<tr>
<td>Always provides the right kind of food</td>
<td>Does not consistently provide the right kind of food</td>
</tr>
<tr>
<td>Clean and comfortable environment</td>
<td>Moderately clean and comfortable environment</td>
</tr>
<tr>
<td>Very prompt service</td>
<td>Not very prompt service</td>
</tr>
</tbody>
</table>
Nonalignable differences:
- Food with moderate quality
- Expensive price
- Occasional billing error

All staff members are pleasant-looking
Friendly reception
Partitioned smoking area

**TABLE A2**
BRAND STIMULI FOR THE PHYSICIANS (PILOTS AND STUDY 1)

<table>
<thead>
<tr>
<th>Alignable differences:</th>
<th>Alignable differences:</th>
<th>Nonalignable differences:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attentive when answering patient’s questions</td>
<td>Moderately attentive when answering patient’s questions</td>
<td>Not very prompt and efficient admission process</td>
</tr>
<tr>
<td>Clear explanations regarding the suggested medicine and its side effects</td>
<td>Not consistently clear explanation regarding the suggested medicine and its side effects</td>
<td>Not very comfortable during the physical examination</td>
</tr>
<tr>
<td>Reasonable price for annual checkup</td>
<td>Expensive price for annual checkup</td>
<td>Some personal attention received from the doctor</td>
</tr>
<tr>
<td><strong>First set</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alignable differences:</td>
<td>Alignable differences:</td>
<td>Nonalignable differences:</td>
</tr>
<tr>
<td>Prompt and efficient admission process</td>
<td>Not very prompt and efficient admission process</td>
<td>Not very clear explanation provided by doctor about your health condition and treatment</td>
</tr>
<tr>
<td>Comfortable physical examination</td>
<td>Not very comfortable during the physical examination</td>
<td>Not very clear explanation on how to care for your condition at home</td>
</tr>
<tr>
<td>High personal attention received from the doctor</td>
<td>Some personal attention received from the doctor</td>
<td>The room is not consistently clean</td>
</tr>
<tr>
<td><strong>Second set</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alignable differences:</td>
<td>Alignable differences:</td>
<td>Nonalignable differences:</td>
</tr>
<tr>
<td>Clear and complete explanation provided by doctor about your health condition and treatment</td>
<td>Not very clear explanation provided by doctor about your health condition and treatment</td>
<td>Not very clear explanation on how to care for your condition at home</td>
</tr>
<tr>
<td>Clear explanation on how to care for your condition at home</td>
<td>The environment is not consistently clean</td>
<td></td>
</tr>
<tr>
<td>Clean environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Third set</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alignable differences:</td>
<td>Alignable differences:</td>
<td>Nonalignable differences:</td>
</tr>
<tr>
<td>Moderately attentive when answering patient’s questions</td>
<td>Prompt and efficient admission process</td>
<td>Not very prompt and efficient admission process</td>
</tr>
<tr>
<td>Does not always explain about the prescribed medicine and its side effects</td>
<td>Comfortable physical examination</td>
<td>Not very comfortable during the physical examination</td>
</tr>
<tr>
<td>Expensive price for annual checkup</td>
<td>High personal attention received from the doctor</td>
<td>Some personal attention received from the doctor</td>
</tr>
</tbody>
</table>

**TABLE A3**
BRAND STIMULI FOR THE HAIR SALONS AND CAREER DEVELOPMENT AGENCIES (STUDY 2)

<table>
<thead>
<tr>
<th>Alignable differences:</th>
<th>Alignable differences:</th>
<th>Nonalignable differences:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating for courtesy of the staff: 9 points</td>
<td>Rating for courtesy of the staff: 7 points</td>
<td>Clean environment</td>
</tr>
<tr>
<td>Reasonable price</td>
<td>Expensive price</td>
<td></td>
</tr>
<tr>
<td>Hundreds of different hairstyles to choose from</td>
<td>Limited variety of hairstyles to choose from</td>
<td>Clear explanation on the most appropriate styles to suit yourself</td>
</tr>
</tbody>
</table>

*Career development agency A*  |
- Moderate waiting time
- Not all facilities are up-to-date
- Not consistently efficient service delivery processes

*Career development agency B*  |
- Clean environment
- Clear explanation on the most appropriate styles to suit yourself
- Very easy to obtain appointment

**Alignable differences:**
- Rating for ease of obtaining appointment: 9 points
- Rating for ease of obtaining appointment: 7 points
Background of the counselor: highly experienced and qualified
Comfortable environment
Nonalignable differences:
Not very adept at how to make you relaxed
Just so-so communication skill
Not very convenient location

Background of the counselor: moderately experienced and qualified
Moderately comfortable environment
Clear explanation for options you can use to solve your problems
Have up-to-date equipment
High personal attention received from the counselor

### TABLE A4
BRAND STIMULI FOR THE HOTELS AND THE DENTISTS (STUDY 3)

<table>
<thead>
<tr>
<th>Hotel A</th>
<th>Hotel B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alignable differences:</strong></td>
<td><strong>Alignable differences:</strong></td>
</tr>
<tr>
<td>Rating for the security personnel's responsibility: 9 points</td>
<td>Rating for the security personnel's responsibility: 7 points</td>
</tr>
<tr>
<td>Rating for quietness and comfort of the room: 8.5 points</td>
<td>Rating for quietness and comfort of the room: 7 points</td>
</tr>
<tr>
<td>Prompt service when you need help</td>
<td>Not very prompt service when you need help</td>
</tr>
<tr>
<td><strong>Nonalignable differences:</strong></td>
<td><strong>Nonalignable differences:</strong></td>
</tr>
<tr>
<td>Some hotel staff are not very friendly</td>
<td>Good fire prevention system</td>
</tr>
<tr>
<td>Not very convenient reservation process</td>
<td>Clean and tidy lobby</td>
</tr>
<tr>
<td>Not always accurate billing</td>
<td>Efficient and quick check-in</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dentist A</th>
<th>Dentist B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alignable differences:</strong></td>
<td><strong>Alignable differences:</strong></td>
</tr>
<tr>
<td>Rating for ease of obtaining appointment: 9 points</td>
<td>Rating for ease of obtaining appointment: 7 points</td>
</tr>
<tr>
<td>Qualification of the dentist: specialist</td>
<td>Qualification of the dentist: general</td>
</tr>
<tr>
<td>Comfortable environment</td>
<td>Moderately comfortable environment</td>
</tr>
<tr>
<td><strong>Nonalignable differences:</strong></td>
<td><strong>Nonalignable differences:</strong></td>
</tr>
<tr>
<td>Not very adept at how to make you feel relaxed</td>
<td>Very clear explanation on the alternative treatment options</td>
</tr>
<tr>
<td>Not always feel secure dealing with the dentist</td>
<td>Have up-to-date equipment</td>
</tr>
<tr>
<td>Moderate reputation</td>
<td>Reasonable price</td>
</tr>
</tbody>
</table>

### REFERENCES


