Evidence reveals that many customers who state that they are satisfied with a service provider nevertheless defect. In this article, the authors focus on identifying which customers are vulnerable to defection despite their stated high levels of satisfaction. Building on the recently developed Judgment Uncertainty and Magnitude Parameters (JUMP) model, the authors decompose customers’ stated satisfaction into two related but independent facets—satisfaction level and satisfaction strength—and then examine the role of satisfaction strength in the translation of satisfaction into loyalty. Using data from an ongoing customer satisfaction tracking study being conducted by a large U.S.-based service organization, Study 1 examines the role of satisfaction strength in shaping the satisfaction–loyalty link in a business-to-business setting. Study 2, a conceptual replication in a business-to-consumer context, examines the hypothesized relationships in a service failure/recovery situation. The studies strongly demonstrate that satisfaction strength plays a central role in the translation of stated satisfaction into loyalty. A key finding is that though satisfaction translates into loyalty when satisfaction is strongly held (i.e., low uncertainty), the translation is significantly lowered, on average, by approximately 60% when the same satisfaction is more weakly held (i.e., high uncertainty). The studies also indicate that prior relationship aspects (length of relationship, volume of business, and favorability of prior experiences) result in even greater vulnerability.

Satisfaction Strength and Customer Loyalty

Even as the literature on customer satisfaction burgeons and practitioners make great strides in dissecting databases to know which customers are less or more profitable, anticipation of defection remains an elusive goal. The starkness of this reality is underscored by anecdotal and empirical evidence that suggests that many customers who state that they are satisfied with a service provider subsequently switch to a competitor. For example, a study for the U.S. Office of Consumer Affairs (Technical Assistance Research Program 1986) finds that in households with service problems, only 54% would maintain brand loyalty if their problems were satisfactorily resolved. Similarly, Reichheld (1996) notes that 65%–85% of customers who defect report before defection that they were satisfied or very satisfied. In turn, a recent meta-analysis of customer satisfaction research finds that satisfaction explains less than 25% of the variance in repeat purchase (Szymanski and Henard 2001; see also Rust et al. 1999).

In this article, we focus on understanding which customers are vulnerable to defection despite stating high levels of satisfaction. We are motivated by research that contends that the translation of satisfaction into loyalty depends on other variables. For example, Lemon, White, and Winer (2002) and Rust, Lemon, and Zeithaml (2004) maintain that many nonsatisfaction elements drive loyalty and illustrate that relational elements that increase switching costs are important factors in whether satisfaction has a strong relationship to loyalty. We focus on an aspect of the satisfaction judgment itself that has received little attention in the literature—namely, the strength with which the satisfaction judgment is held.

Our central thesis is that satisfaction strength is a vital determinant of customer vulnerability because it plays a
crucial role in the translation of stated satisfaction into customer loyalty. Examining the strength with which customer sentiments are held is important in the context of ongoing customer relationships and after critical events that may serve to destabilize customer relationships (e.g., service failures). Because service variability and service failures can sensitize customers to the potential downside of dealing with a service provider, they increase uncertainties and fears that can threaten the relationship and result in customers becoming vulnerable to defection. In turn, customer behavior hinges on successful resolution of these uncertainties. However, extant satisfaction research focuses almost entirely on the magnitude of judgments (e.g., the level of customer satisfaction) and ignores the contemporaneous conviction (i.e., the strength) with which customer judgments are held. As a result, researchers have not secured insights into how ongoing service delivery and service recovery actions crystallize into strongly held customer sentiments (producing “secure” and loyal customers) or precipitate sentiments that are largely fragile (producing vulnerable customers who might profess favorable sentiments that may be impotent and laden with uncertainty). It would also be useful to understand whether various aspects of prior relational experience (e.g., length of relationship with the supplier, volume of business, favorability of prior experience) insulate customers from this vulnerability.

In the next section, we propose a two-dimensional view of satisfaction that centers simultaneously on the satisfaction level and strength. We then assess our theorization in the context of two studies. Table 1 presents an overview of the two studies. The two studies, which cover different business contexts, different operationalizations of loyalty, and different aspects of prior relational experience, strongly converge to support our theory and illuminate the role of satisfaction strength and prior relational experience in the translation of satisfaction into loyalty.

**RESEARCH FRAMEWORK**

We build on the extant satisfaction and judgment formation streams of literature to recognize that a customer’s overtly stated satisfaction is composed of two related but distinct dimensions: the level of satisfaction and the covert strength with which that satisfaction judgment is held. Several lines of thought support this two-dimensional conceptualization of revealed satisfaction. For example, scholars in the area of services marketing note that customer expectations are often fuzzy (e.g., Rust et al. 1999), and it is often difficult for customers to estimate precisely the level of service they received (Parasuraman, Zeithaml, and Berry 1985). Thus, it is likely that the resultant satisfaction judgments are laden with uncertainty. Consequently, customers are likely to differ in the strength with which they hold their satisfaction. This is also consistent with the psychological view of human judgments that Koehler (1994, p. 461) succinctly expresses: “Although we believe a great many things, we hold some of our beliefs with greater conviction than others.”

The characterization of satisfaction as a multifaceted “statistical” construct stridently resonates with the literature on modeling individual judgments as well. For example, Chandrashekaran and colleagues (2000; see also Chandrashekaran, Rotte, and Grewal 2005) propose the Judgement Uncertainty and Magnitude Parameters (JUMP) model, which focuses on the simultaneous manifestation of uncertainty in the variation surrounding the central tendency of stated judgments. Grounded in the notions of Brunswikian uncertainty, which considers human judgments in a social context (see Juslin and Olsson 1997), the JUMP model takes an overtly stated measure and estimates the impact of independent variables on the magnitude and uncertainty that is inherent in the overt judgment. Likewise, noting that the uncertainty in customer expectation judgments is reflected in the variance surrounding simple point expectations, Rust and colleagues (1999) caution researchers that it may be insufficient to measure only the point expectation, as has been standard practice; instead, researchers should also measure uncertainty with respect to the level of service that will be received.

In summary, therefore, we argue that a constructive way to view satisfaction is that it is based on fuzzy expectations and a fuzzy assessment of experience, which in turn is based on an understanding of the distributions of actions (and outcomes) of others. Similar to Rust and colleagues (1999), we suggest that by viewing satisfaction as a simple point assessment, extant research has immediately assumed that all that is important is the mean of these distributions. In turn, consistent with the JUMP model (Chandrashekaran et al. 2000; Chandrashekaran, Rotte, and Grewal 2005), we suggest that though the mean of this distribution is an index of the level of satisfaction, the variance of the distribution is related to the strength (i.e., conviction or certainty) with which this satisfaction is professed.

**Satisfaction Model**

Letting SAT$_i$ denote the stated satisfaction of the $i$th customer, we recognize that SAT$_i$ is a realization from a distribution of possible judgments, such that SL$_i$, the satisfaction level, reflects the mean, and SU$_i$, the satisfaction uncertainty, manifests itself in the variance of that distribution:

1. \[ SAT_i = \beta_0 + SL_i + \varepsilon_i; \] where $\sigma^2$ denotes the measurement- and model-error variance; \[ \beta_0 \] is a point expectation, as has been standard practice; \[ SL_i \] and \[ SU_i \] are vectors of variables hypothesized to affect satisfaction level and uncertainty, respectively; \[ \beta = [\beta_1, \beta_2, \ldots, \beta_p] \] and \[ \gamma = [\gamma_1, \gamma_2, \ldots, \gamma_p] \] denote column vectors of the impacts of \[ X_i \] and \[ Z_i \], respectively. The specific elements of \[ X_i \] and \[ Z_i \] come from theory and the specific substantive setting of the particular research study. Consistent with the JUMP model procedure (Chandrashekaran, Rotte, and Grewal 2005), we can straightforwardly estimate the parameters of interest using feasible generalized least squares, in which (1) SAT is regressed with weighted least squares (WLS) on \[ X \] to obtain estimates for \[ \beta_0 \] and \[ \beta \]; (2) the squared residual (i.e., $e^2 = (SAT - \beta_0 - X\beta)^2$), which is an estimate of the individual-level variance with the same asymptotic properties as $\epsilon_i^2$, is regressed on \[ Z \] to obtain estimates $\hat{\sigma}^2$ and $\hat{\gamma}$; (3) $e^2$ is regressed with weighted least squares (WLS) on \[ Z \] with $Z^2\hat{\sigma}^2 + Z\hat{\gamma}^2$ as the weight and with the constraint that $\hat{\sigma}^2 + Z\hat{\gamma}^2 > 0$, where $\hat{\sigma}^2$ and $\hat{\gamma}$ are the WLS estimates of $\sigma^2$ and $\gamma$; and (4) SAT is regressed on \[ X \] with a WLS model with $\hat{\sigma}^2 + Z\hat{\gamma}^2$ as the weight to obtain unbiased and efficient estimates
Satisfaction Strength and Customer Loyalty

Table 1
OVERVIEW OF EMPIRICAL STUDIES

<table>
<thead>
<tr>
<th>Study</th>
<th>Setting</th>
<th>Data Source</th>
<th>Key Satisfaction Antecedent Variables</th>
<th>Theoretical Perspective for Satisfaction</th>
<th>Aspect of Loyalty</th>
<th>Aspect of Prior Relational Experience Investigated</th>
<th>Key Issues Examined</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ongoing business-to-business service relationships; customers of one service provider firm (ABC); customers belong to a wide range of industries.</td>
<td>Ongoing national customer satisfaction-tracking study in ABC; n = 25,489</td>
<td>Service attribute quality perceptions (measured with seven service attributes), satisfaction with service representative, responsiveness of territory office.</td>
<td>Satisfaction level and strength are driven by service quality, relationship with key contact in supplier firm, and customer orientation of ABC.</td>
<td>•Recommend service provider to other customers</td>
<td>•Length of relationship •Volume of business</td>
<td>•Does satisfaction translate into loyalty? •Does weakly held satisfaction translate into a lesser degree? •Does prior relational experience influence the translation of satisfaction? •Do aspects of prior relational experience mitigate the effects of weakly held satisfaction?</td>
</tr>
<tr>
<td>2</td>
<td>Consumer decision making after service failures in business-to-consumer relationships; each customer reports on experiences with service providers that belong to a wide range of industries.</td>
<td>Tax, Brown, and Chandrashekaran (1998); n = 221</td>
<td>Perceptions of justice (interactional, procedural, and distributive justice).</td>
<td>Social justice elements as antecedents of satisfaction level and strength.</td>
<td>•Commitment •Propensity to provide word of mouth</td>
<td>•Favorability of prior experience</td>
<td>Focus is on conceptual replication of Study 1: •Satisfaction level and strength are shaped by customer perceptions of ongoing service actions. •Satisfaction strength affects the translation of stated satisfaction into loyalty. •Prior relational experience influences the impact of satisfaction strength on the satisfaction-loyalty link.</td>
</tr>
</tbody>
</table>
for $\beta_0$ and $\beta$ (for statistical proofs, see Amemiya 1985; Greene 1997). Then, $Z_i^q$ gives an estimate of individual satisfaction uncertainty.

**Loyalty Model**

Research indicates that though satisfaction is linked to some aspects of loyalty (e.g., Anderson and Sullivan 1993; Mittal and Kamakura 2001; Oliver 1997), its impact may depend on facets of the prior relational experience (e.g., Rust, Lemon, and Zeithaml 2004). In addition, we anticipate that satisfaction strength will influence both loyalty and the translation of satisfaction into loyalty.

**Role of satisfaction strength.** We anticipate that uncertainty in customer evaluations hinders continued patronage (Kardes 1994). Drawing from research in psychology and marketing, we advance the notion that satisfaction strength plays an important role in the translation of stated satisfaction into loyalty. The specific conjecture that is widely believed in the psychology literature is that strongly held judgments (i.e., those with little uncertainty) are more likely to translate into subsequent behavior (Gross, Holz, and Miller 1995; Kardes 1994). In a similar vein, Chandrashekaran and colleagues (2000) find that intention uncertainty significantly lowers the translation of intention judgments into actual behavior. Therefore, we expect that the translation of stated satisfaction into loyalty will increase (decrease) as the satisfaction strength increases (decreases).

**Role of prior relational experiences: insulation or isolation?** In general, it is believed that long-standing and happy customers are more loyal (e.g., more likely to provide recommendations and positive word of mouth; Zeithaml, Berry, and Parasuraman 1996). We also expect that prior relational experiences (duration, valence, and business volume) will affect the translation of satisfaction into loyalty.

According to one perspective, in an “insulation” process, more prior relational experience facilitates the transfer of satisfaction into loyalty and helps overcome the deleterious impact of weakly held satisfaction judgments (e.g., Anderson and Sullivan 1993). In addition, Tax, Brown, and Chandrashekaran (1998) suggest that prior positive experiences mitigate the harmful effects of dissatisfaction. Finally, volume of business may be directly related to switching costs, especially if up-front investment is proportional to the volume of business. Therefore, we may observe more forgiving behavior among larger accounts that prevails over the negative effect of dissatisfaction and weakly held satisfaction.

According to another perspective, in an “isolation” process, prior relational experience may exacerbate the impact of dissatisfaction and the damaging impact of weakly held satisfaction judgments. For example, long-standing customers and those with previously favorable experiences may have higher expectations, may be more sensitive to defects that promote uncertainty, and may be less forgiving than new customers. In support of this reasoning, research in organizational psychology (e.g., Brockner, Tyler and Cooper-Schneider 1992) shows that negative deviations from expectations have the greatest negative influence on the most loyal customers. In a similar vein, larger accounts are typically those with greater buyer power (see Rangan, Moriarty, and Swartz 1992); they are more demanding in their service requests but are unwilling to pay for enhanced service and are more sensitive to deviations from already high expectations. According to this outlook, we may find that satisfaction translates into loyalty to a lesser extent for larger accounts and for long-standing customers, and the negative impact of weakly held satisfaction will be exacerbated.

In summary, letting $\hat{P}_{REL}$ denote the vector of prior relational experience variables, we express the customer loyalty model as follows (note that $\hat{t}_y$, $\hat{t}_p$, and $\hat{t}_{PU}$ are vectors):

$$\begin{align*}
(3a) & \text{ Loyalty } = t_0 + t_{SAT} \cdot SAT + t_2 \cdot SU + t_3 \cdot \hat{P}_{REL} \text{ and } \\
(3b) & \text{ SAT } = t_5 + t_6 \cdot SU + t_7 \cdot \hat{P}_{REL} + t_8 \cdot \hat{P}_{REL} \cdot SU.
\end{align*}$$

Of central interest is the interplay between satisfaction strength and prior relational experiences in shaping the translation of satisfaction into loyalty, that is, on $t_{SAT}$. Substantively, therefore, the key parameters of interest are those that involve the translation of satisfaction (i.e., $t_5$, $t_6$, $t_7$, and $t_8$). We expect that (1) if $t_7 > 0$, satisfaction will translate into loyalty; (2) if $t_5 < 0$, satisfaction uncertainty will impair the translation of stated satisfaction into loyalty; and (3) if $t_p > 0$ and $t_{PU} > 0$, an insulation hypothesis is in evidence, and if $t_p$ and $t_{PU}$ are negative, the evidence will implicate an isolation process.

**STUDY 1: SATISFACTION AND LOYALTY IN ONGOING BUSINESS-TO-BUSINESS SERVICE RELATIONSHIPS**

**Setting and Data**

ABC is a large service organization (2004 sales were greater than $2 billion) that operates in the business-to-business services market in the United States and Canada and serves a wide variety of firms. ABC has several hundred territory offices, each of which is responsible for hundreds of business customers. A territory manager, who reports to one of several regional managers, oversees the operations of that territory and supports several dozen service sales representatives. Each representative, who typically interacts with one contact person in the customer firm, services several customers on a weekly basis. Because of the frequency of the interaction, the contact in the customer firm and the sales representative often develop close bonds that, in many cases, involve a social component as well.1

Every month, with the aid of a structured survey, ABC conducts telephone interviews with approximately 4000 customers as part of an ongoing customer satisfaction tracking initiative. A quota sample method is employed to sample customers from a range of territories, and within each territory, customers are randomly selected. When a customer firm is sampled and surveyed, it is taken out of the sampling frame for an 18-month period. In each case, the interview is conducted with the key contact person at the customer firm (or a person who is intimately involved with the service). The questions in the survey measure customer perceptions of the service delivery, the responsiveness of ABC’s territory office to customer requests and complaints,

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1Management of the firm, as well as informal interviews with the representatives and customers during the course of numerous field visits in connection with this research project, indicated this. Furthermore, we are unable to specify the company, the core product, or the precise service attributes because of confidentiality reasons.
satisfaction with the representative and overall satisfaction with ABC, and whether the customer would recommend ABC to other customers. The data from the survey were combined with relationship duration and sales data obtained from company records.

Attribute quality perceptions (ATTQ) were measured with five-point Likert scales anchored by “strongly agree” and “strongly disagree” for each of seven service attributes (ATTQ = \( \sum_{j=1}^{7} \text{ATT}_j \)). Through its research process and in conjunction with a large market research house, ABC has determined that seven attributes, which comprehensively cover all aspects of the service delivery, are important to customers in evaluating service delivery. The attributes in this context are comparable to attributes such as “food was warm,” “service was timely,” and “restaurant was clean” if the study were being conducted in the restaurant industry. In turn, territory office responsiveness (RESPON) was measured with a five-point scale anchored by “strongly agree” and “strongly disagree.” Next, satisfaction with the representative (SATREP) was measured by asking the customer to report on a four-point Likert scale (4 = “highly satisfied,” 3 = “satisfied,” 2 = “somewhat satisfied,” and 1 = “dissatisfied”). Overall satisfaction (SAT) was measured with a four-point scale anchored similarly to the SATREP scale, and loyalty was measured by asking customers whether they would recommend ABC to other customers. As Table 1 indicates, this analysis explores two aspects of prior relational experience: (1) prior experience in terms of relationship duration (RDUR)—data were provided on a four-point ordinal scale—and (2) sales volume (SALES)—ABC provided data on the average weekly sales volume for the period of the fiscal year up until the satisfaction measurement.

Models and Expectations

Satisfaction. We explore the impact of three variables: attribute quality perceptions, responsiveness of the territory office to customer requests and complaints, and satisfaction with the service representative. Building on the view that attribute quality perceptions drive satisfaction (e.g., Kordupleski, Rust, and Zahorik 1993; Mittal, Ross, and Baldasare 1998), we expect that favorable service attribute quality enhances satisfaction level and satisfaction strength. These expectations are consistent with research that centers on the role of information on customer attitudes; that is, favorable information increases attitudinal favorability and strength, whereas unfavorable information decreases attitudinal favorability and increases customer uncertainty (Kardes 1994). In a similar vein, we expect that territory office responsiveness increases the level and strength of satisfaction. The expectations for territory office responsiveness are also justified by the notion of customer orientation; that is, when a customer perceives a supplier as being more responsive to his or her requests and complaints, he or she has a more favorable view of the supplier, and this view is likely to be strongly held.

Turning to the impact of satisfaction with the representative on satisfaction level and strength, we expect that there is a positive relationship between satisfaction with the representative and satisfaction with the firm. However, as customers become increasingly satisfied with the individual key contact and the relationship becomes stronger, it opens up the potential for anxieties in customers’ minds. To a large extent, these anxieties stem from the possibility of losing the representative because of a promotion, an internal transfer, or the representative quitting the service provider firm. In turn, as Bendapudi and Leone (2002, p. 86) report, customers often entertain concerns about the time it may take “to bring the replacement employee up to speed.” Indeed, during the course of our field visits, several customers who articulated that they “simply loved” their representative hastened to voice their concern that they “just would not want to lose him [or her].” Indeed, it was as if the satisfaction and anxiety were coexisting sentiments in the customers’ minds; an admission of high satisfaction with the representative instantly set off the anxiety as well. Such trepidations increase customer uncertainty and make the relationship between the customer and the service provider firm more vulnerable. Thus, we expect that though satisfaction with the representative may increase the level of satisfaction with the firm, it simultaneously decreases the strength of that satisfaction.

Incorporating these variables into the model specification in Equations 1 and 2, we derive the following expressions for satisfaction level and satisfaction strength, the two latent dimensions of satisfaction for customer i from territory office k:

(4) \[ SL_{ik} = \beta_1 \text{ATTQ}_{ik} + \beta_2 \text{SATREP}_{ik} + \beta_3 \text{RESPON}_{ik} + \epsilon_{ik}, \]

(5) \[ SU_{ik} = \gamma_1 \text{ATTQ}_{ik} + \gamma_2 \text{SATREP}_{ik} + \gamma_3 \text{RESPON}_{ik}, \]

where ATTQ = \( \sum_{j=1}^{7} \text{ATT}_j \) and \( \beta_1, \beta_2, \beta_3, \gamma_1, \gamma_2, \gamma_3 \) capture unobserved heterogeneity due to territory. We expect that \( \beta_1 > 0, \gamma_1 < 0; \beta_2 > 0, \gamma_2 > 0; \) and \( \beta_3 > 0, \gamma_3 < 0. \)

Loyalty. In this stage, we include a set of terms for each aspect of prior relational experience (relationship duration and sales volume) to derive the following loyalty model from Equations 3a and 3b:

(6a) \[ \tau_{S_{SAT}} = \tau_0 + \tau_{SAT} \times \text{SAT} + \tau_S \times \text{SU} + \tau_{RDUR} \times \text{RDUR} + \tau_{SALES} \times \text{SALES}, \]

and

(6b) \[ \tau_{S_{SAT}} = \tau_S + \tau_{SU} \times \text{SU} + \tau_{RDUR} \times \text{RDUR} + \tau_{SALES} \times \text{SALES} \times \text{SU}. \]

Because the dependent variable was dichotomous (yes/no to the recommendation question), we use the probit model framework that also controls for unobserved heterogeneity due to territory.

Results

Satisfaction. The overall two-dimensional model of satisfaction that examined the drivers of satisfaction level and strength was significant (\( \chi^2 = 18,005.95, p < .0001 \)). The hypothesized antecedents of satisfaction level account for 53.4% of the variation in the central tendency of the stated satisfaction, and those of satisfaction strength account for 17.3% of the variance of the distribution of stated satisfaction. We obtained the following estimates:

* \( \beta_1 = .3 (p < .0001) \), and \( \gamma_1 = -.099 (p < .0001) \): Attribute quality perceptions increase the level of satisfaction and decrease the uncertainty (i.e., increase the strength of satisfaction).

* \( \beta_2 = .386 (p < .0001) \), and \( \gamma_2 = .046 (p < .0001) \): Satisfaction with the representative increases satisfaction level and satisfac-
tion uncertainty (i.e., reduces the strength with which satisfaction is held). This supports our conjecture that closer relationships between the customer and the individual representative may actually undermine (i.e., make more vulnerable) the relationship between the customer and the firm. \( \beta_1 = .085 \) (\( p < .0001 \)), and \( \beta_3 = -.054 \) (\( p < .0001 \)): Responsiveness of the territory office enhances satisfaction level and reduces satisfaction uncertainty (increases satisfaction strength).

**Loyalty.** The overall probit model for loyalty was significant (\( \chi^2 = 11,328.04 \), \( p < .0001 \)). We also examined the model performance against a restricted model that did not incorporate satisfaction strength. Thus, within Equations 6a and 6b, using a likelihood-ratio test, we tested \( H_0: \tau_2 = \tau_3 = \tau_{PUb} = \tau_{PUh} = 0 \). The results reject the null hypothesis (\( \chi^2_2 = 1462.88 \), \( p < .0001 \)), including satisfaction strength into the analysis brings significant explanatory power.

The estimation results (see Table 2) support our theory that satisfaction strength and prior relational experience influence the translation of revealed satisfaction into loyalty. In addition to a positive impact of satisfaction (\( \hat{\tau}_S = 1.684 \), \( p < .0001 \)), the estimation uncovered the following:

- A significant and positive estimate for \( \hat{\tau}_3 \) (\( \hat{\tau}_3 = .113 \), \( p < .10 \)) but a nonsignificant estimate for \( \hat{\tau}_2 \): Customers with longer relationships are more likely to be loyal, but the stated satisfaction of these customers does not translate into loyalty any more than that for others.
- A significant and negative estimate for the interaction between satisfaction and satisfaction uncertainty (\( \hat{\tau}_U = -.417 \), \( p < .0001 \)): Stated satisfaction translates into loyalty to the greatest extent when the satisfaction uncertainty is lowest (i.e., when satisfaction is most strongly held).
- A negative three-way interaction among satisfaction, satisfaction uncertainty, and relationship duration (\( \hat{\tau}_{PUa} = -.040 \), \( p < .01 \)): The harmful impact of satisfaction uncertainty becomes worse as relationship duration increases.
- A negative three-way interaction among satisfaction, satisfaction uncertainty, and sales volume (\( \hat{\tau}_{PUb} = -.033 \), \( p < .05 \)): The harmful impact of satisfaction uncertainty becomes worse as sales volume increases.

The negative values of \( \hat{\tau}_{PUa} \) and \( \hat{\tau}_{PUh} \) indicate the presence of an isolation process; the deleterious impact of satisfaction uncertainty is most pronounced for long-standing customers and those with a greater volume of business. To examine these interactions in more detail, we computed and tested the net translation of satisfaction into loyalty (\( \tau_{SAT} \); see Equation 6b) at various levels of satisfaction uncertainty and relationship duration and sales volume. Table 3 presents the results of testing \( \tau_{SAT} \) at the mean level of relationship duration and sales volume. Note that as the satisfaction judgment becomes more weakly held (moving left to right in the table), \( \tau_{SAT} \) steadily decreases. When satisfaction is most weakly held, \( \tau_{SAT} \) evidences a 60% reduction from when satisfaction is most strongly held. Importantly, even when the satisfaction judgment is weakly held, it translates into loyalty; however, the translation is much smaller than when the same level of satisfaction is more strongly held. These findings illustrate the important role of satisfaction strength in the satisfaction–loyalty link; customers with weakly held satisfaction have a greater risk of defection than customers with more strongly held satisfaction. We also examined the reduction in \( \tau_{SAT} \) for different levels of relationship duration and sales volume. The greatest reduction was 78% (1.59 to .35) for the longest-standing customers with the greatest amount of sales volume.

**STUDY 2: SATISFACTION AND LOYALTY AFTER SERVICE FAILURES IN BUSINESS-TO-CONSUMER RELATIONSHIPS**

**Setting and Data**

We employed data from the work of Tax, Brown, and Chandrashekaran (1998) to validate our theorization. The current study differs from Tax, Brown, and Chandrashekaran’s study in two significant ways. First, Tax, Brown, and Chandrashekaran were mainly focused on the role of justice perceptions (interactional, procedural, and distributive) in shaping the level of satisfaction. We are interested in the simultaneous impact of these antecedents on the level and strength of satisfaction. Second, these authors did not focus on the impact of satisfaction strength on the translation of satisfaction into loyalty. However, this is our central focus.

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Parameter</th>
<th>Estimate</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>( \tau_S )</td>
<td>1.684***</td>
<td>.092</td>
</tr>
<tr>
<td>SU</td>
<td>( \tau_2 )</td>
<td>.075</td>
<td>.362</td>
</tr>
<tr>
<td>RDUR</td>
<td>( \tau_3 )</td>
<td>.113*</td>
<td>.070</td>
</tr>
<tr>
<td>SALES</td>
<td>( \tau_4 )</td>
<td>.038</td>
<td>.068</td>
</tr>
<tr>
<td>SAT \times SU</td>
<td>( \tau_U )</td>
<td>-.417***</td>
<td>.128</td>
</tr>
<tr>
<td>SAT \times RDUR</td>
<td>( \tau_5 )</td>
<td>-.005</td>
<td>.019</td>
</tr>
<tr>
<td>SAT \times SALES</td>
<td>( \tau_6 )</td>
<td>-.040***</td>
<td>.016</td>
</tr>
<tr>
<td>SAT \times SU \times RDUR</td>
<td>( \tau_{PUa} )</td>
<td>-.033**</td>
<td>.016</td>
</tr>
<tr>
<td>SAT \times SU \times SALES</td>
<td>( \tau_{PUh} )</td>
<td>-.11747.82</td>
<td></td>
</tr>
<tr>
<td>Log-likelihood</td>
<td></td>
<td>-17.411.84</td>
<td></td>
</tr>
</tbody>
</table>

* \( p < .10 \).
** \( p < .05 \).
*** \( p < .01 \).

Notes: A positive (negative) coefficient indicates that the corresponding variable results in an increase (decrease) in the likelihood of recommending ABC to other customers.
We used a cross-sectional survey design to assess respondents’ evaluations of their most recent service-related complaint (for details of the study, measures, and measure validation, see Tax, Brown, and Chandrashekaran 1998). Most complaints were lodged in reference to problems that were judged to be important to the complainants; the mean response to the question, “How important to you was the problem that led to your complaint?” was 6.43 on a seven-point scale (7 = “very important”). The relevant data for the present investigation came from a sample of 221 customers and included perceptions of interactional justice (IJ), procedural justice (PJ), distributive justice (DJ), judgments of satisfaction with the service recovery (SAT), favorability of prior experience (FPEX), and loyalty; we measured these items in terms of commitment to the service provider (four items) and propensity to provide word of mouth (four items). We averaged the scores on the commitment and word-of-mouth scales to yield the loyalty measure.

Models and Expectations

**Satisfaction.** We explore the impact of the three justice components on satisfaction level and strength. Prior research (Smith, Bolton, and Wagner 1999; Tax, Brown, and Chandrashekaran 1998) has offered conjectures for how the three justice components may shape the level of satisfaction, so we do not repeat these here. On the basis of that theorization, we specify the level of satisfaction as follows:

\[
S_{ij} = \beta_I I_{ij} + \beta_P P_{ij} + \beta_D D_{ij} + \beta_{IJ} I_{ij} \times P_{ij} + \beta_{IP} I_{ij} \times P_{ij}
\]

In terms of satisfaction strength, at a fundamental level, a service failure introduces uncertainty into consumers’ minds, and the manner in which the complaint is handled bears the potential to mitigate or exacerbate this uncertainty. Therefore, we conjecture that the interplay among the same three justice elements will shape satisfaction strength in this setting. For example, greater interactional justice may produce a perception that the people who are involved in addressing complaints are working to correct a problem. The elements of procedural justice are similarly diagnostic of the service provider’s operations and commitment to customer service. Thus, a service recovery that is perceived as interactionally and procedurally fair may engender attributions of reliability, which in turn can reduce satisfaction uncertainty (i.e., increase satisfaction strength).

In contrast, distributive justice pertains to resource allocation and the perceived outcome of exchange (Deutsch 1985). On its own, distributive justice provides little information to the consumer about whether the problem that happened in the first place (i.e., the service failure) is a rare event. Thus, although an organization’s actions may be consistent with equity principles, thus evoking perceptions of distributive justice, they may not serve to increase perceptions of reliability. Rather, we expect that in situations characterized by low levels of interactional and procedural justice, distributive justice increases satisfaction uncertainty (i.e., it decreases satisfaction strength); the consumer has little information with which to assess the service provider’s operations and commitment to service-driven satisfaction and the likelihood of recurrence of the problem. However, increases in procedural and interactional justice are likely to mitigate this effect. Specifically, from an information theoretic perspective, we expect that the damaging effect of distributive justice on satisfaction strength decreases as interactional and procedural justice increases. Thus, we express satisfaction strength as follows:

\[
SU_{ij} = \gamma_I I_{ij} + \gamma_P P_{ij} + \gamma_D D_{ij} + \gamma_{IJ} I_{ij} \times D_{ij} + \gamma_{IP} I_{ij} \times P_{ij}
\]

**Loyalty.** In this study, we focus on loyalty in terms of commitment and propensity to provide word of mouth (Zeithaml, Berry, and Parasuraman 1996). In turn, the aspect of prior relational experience we investigated was the favorability of prior experience. We then estimated the corresponding equations (3a and 3b) to test the theorization.

**Results**

**Satisfaction.** The overall two-dimensional model of satisfaction that examined the drivers of satisfaction level and strength was significant ($\chi^2_{11} = 625.96, p < .0001$). The hypothesized antecedents of satisfaction level accounted for 90.1% of the variation in the central tendency of the stated satisfaction, and the hypothesized antecedents of satisfaction strength account for 16% of the variance of the distribution of stated satisfaction.

As in the work of Tax, Brown, and Chandrashekaran (1998), an examination of the drivers of satisfaction level revealed interactions between distributive justice and inter-

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**Table 3**

WEAKLY HELD SATISFACTION IMPAIRS THE TRANSLATION OF SATISFACTION INTO LOYALTY

<table>
<thead>
<tr>
<th>Level of Satisfaction Uncertainty</th>
<th>Minimum</th>
<th>First Quartile</th>
<th>Midpoint</th>
<th>Third Quartile</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 1</td>
<td>1.63**(.03)</td>
<td>1.38**(.02)</td>
<td>1.14**(.05)</td>
<td>.89**(.09)</td>
<td>.65**(.12)</td>
</tr>
<tr>
<td>Study 2</td>
<td>.77**(.04)</td>
<td>.66**(.04)</td>
<td>.55**(.06)</td>
<td>.44**(.10)</td>
<td>.33**(.12)</td>
</tr>
</tbody>
</table>

*p < .01.

**Notes:** Table entries are the net impact of satisfaction on loyalty (i.e., SAT). On the basis of Equations 6a and 6b, in Study 1, SAT is given by $\tau_{SAT} = \tau_S + \tau_P \times SALES + \tau_D \times RDUR + \tau_R \times SU \times RDUR + \tau_D \times SU \times SALES$. Likewise, in Study 2, by substituting $FPREX = P_{REL}$, the net translation of satisfaction is given by $\tau_{SAT} = \tau_S + \tau_P \times SU + \tau_D \times FPREX + \tau_P \times SU \times FPREX$. Entries are estimates of SAT at the mean level of relationship duration (RDUR) and sales volume (SALES) in Study 1 and at the mean level of favorability of prior experience (FPEX) in Study 2. We performed testing with Wald tests (standard errors are in parentheses).
actional justice and between distributive justice and procedural justice (in both cases, \( p < .05 \)). Because of the interactions, we computed the net effect of each justice dimension at the mean value of the other dimensions. These were .42 (\( p < .05 \)), .35 (\( p < .0001 \)), and .41 (\( p < .0001 \)) for interactional justice, procedural justice, and distributive justice, respectively; each dimension of justice increases the level of satisfaction.

Turning to satisfaction strength, we uncovered a significant interaction between interactional justice and distributive justice and a main effect of distributive justice (the interaction between procedural justice and distributive justice was statistically not significant). Because of the interaction, we again computed the net effect of each justice dimension at the mean value of the other dimensions. These were −.067 (\( p < .05 \)), −.034 (not significant), and .094 (\( p < .0001 \)) for interactional justice, procedural justice, and distributive justice, respectively. These results indicate that though interactional justice increases satisfaction strength (i.e., reduces satisfaction uncertainty), procedural justice has no impact on satisfaction strength, and as we conjectured, distributive justice increases satisfaction uncertainty and produces more weakly held satisfaction judgments.

We further examined our conjecture that increases in interactional justice mitigate the deleterious effect of distributive justice. The results indicate that the impact of distributive justice is at its highest when interactional justice is at its lowest (when interactional justice = 1, net impact of distributive justice is .612, \( p < .0001 \)). In turn, when interactional justice is at its highest level (= 5), the effect of distributive justice is rendered not significant (net impact of distributive justice is .005). This finding supports our theory that distributive justice has the most harmful impact on satisfaction strength when interactional justice is perceived as poor; “throwing money at the problem” without paying attention to other aspects of service recovery induces customer uncertainty, and this manifests in weakly held satisfaction judgments.

Loyalty. A key focus here was to replicate the overall pattern of findings from Study 1 that weakly held satisfaction inhibits the translation of satisfaction into loyalty (negative estimate of \( \hat{\tau}_U \)) and more so for customers with prior positive experiences (negative estimate of \( \hat{\tau}_{PU} \)). The overall model was significant (\( R^2 = .71, \chi^2_3 = 266.48, \hat{p} < .0001 \)). Again, we tested this model against a model that constrained the impact of satisfaction strength to zero (i.e., tested \( H_0: \tau_2 = \tau_4 = \tau_{PU} = 0 \); see Equations 3a and 3b). The results reject this null hypothesis (\( \chi^2_3 = 16.66, \hat{p} < .01 \)); incorporating satisfaction strength enhances the loyalty model performance.

Turning to the specific effects, in addition to a significant, positive main effect of satisfaction (\( \hat{\tau}_S = .77, \hat{p} < .0001 \)) and consistent with the findings from Study 1, we found the following:

• A main effect of favorability of prior experience on loyalty (\( \hat{\tau}_F = .08, \hat{p} < .05 \)) but no evidence of a significant interaction between favorability of prior experience and satisfaction: Customers with positive prior experiences are more likely to be loyal, but the stated satisfaction of these customers does not translate into loyalty any more than that for other customers.

• A negative two-way interaction between satisfaction and satisfaction uncertainty (\( \hat{\tau}_{SU} = -.24, \hat{p} < .05 \)): Stated satisfaction translates into loyalty to the greatest extent when the satisfaction is most strongly held (i.e., lowest uncertainty).

• A negative three-way interaction among satisfaction, satisfaction uncertainty, and favorability of prior experience (\( \hat{\tau}_{SUF} = -.04, \hat{p} < .05 \)): The negative impact of satisfaction uncertainty on the translation of satisfaction is enhanced (made more negative) as the favorability of prior experience increases (i.e., as prior experience becomes more positive).

Again, the negative value of \( \hat{\tau}_{PU} \) implies an isolation process; the harmful effect of satisfaction uncertainty is greatest for customers with prior favorable experiences. To examine the impact of satisfaction uncertainty, we computed and tested the net translation of satisfaction into loyalty (\( \hat{\tau}_{SA} \)) at various levels of satisfaction strength and favorability of prior experience. Table 3 (Study 2) displays the \( \hat{\tau}_{SA} \) analysis at the mean level of favorability of prior experience. Again, we observe that as the satisfaction judgment becomes more weakly held (from left to right in the table), the translation of stated satisfaction into loyalty quickly decreases, and at the most weakly held level of satisfaction, \( \hat{\tau}_{SA} \) evidences a 57% reduction from when satisfaction is most strongly held (recall that the corresponding value in Study 1 was 60%). Even when the satisfaction judgment is weakly held, it translates into loyalty; however, the translation is much smaller than when the same satisfaction judgment is more strongly held. We also examined the reduction in \( \hat{\tau}_{SA} \) for different levels of favorability of prior experience. The greatest reduction in translation of revealed satisfaction was for customers with the most favorable prior relational experience, for whom the reduction in \( \hat{\tau}_{SA} \) was 77% (from .76 to .17).

Overall, the findings from Study 2 converge with those from Study 1 to illustrate the important role of satisfaction strength in the satisfaction–loyalty link. They indicate that customers whose satisfaction scores are weakly held are at a greater risk of defection than customers whose satisfaction scores are more strongly held. A consistent picture also emerges regarding the role of prior relational experiences. In Study 2, favorable prior relational experiences further increase this vulnerability (in Study 1, other aspects of prior relationship also increase customer vulnerability).

DISCUSSION AND CONCLUSION

The key objectives of this article were to examine whether there is something in the measure of satisfaction itself that helps better illuminate the satisfaction–loyalty link. We advanced the view that customer satisfaction can be constructively viewed as a two-dimensional statistical construct that embodies both level and strength. In contrast to extant research that has largely focused on the level of satisfaction, we articulated a model of satisfaction that simultaneously assessed the impact of independent variables on both the level of satisfaction and the strength of satisfaction. We then theorized that weakly held satisfaction would not translate into loyalty and that only strongly held satisfaction would be potent and translate into loyalty. We also examined how different aspects of prior relational experience (length of relationship, volume of business, and favorability of prior experience) influenced this translation process.

We assessed our theorization in the context of two studies that covered a range of market situations. In Study 1, we
focused on one business-to-business service provider whose customers came from a wide range of industries. In Study 2, we focused on individual customer experiences with service providers from various industries. In both studies, the results strongly demonstrate that the covert satisfaction strength assumes a central role in the translation of satisfaction into loyalty. A key finding that we uncover and replicate in this article is that though satisfaction indeed translates into loyalty when the satisfaction judgment is strongly held, on average, the translation is significantly lowered by almost 60% when the same satisfaction is more weakly held. As a result, when there are two customers with identical revealed satisfaction, we are now better able to differentiate between the one who is more likely to be secure and loyal and the one who is more likely to be vulnerable to defection (i.e., bearing a greater potential to switch service providers if the opportunity presents itself, despite professing the highest levels of satisfaction). We also find that prior relational experience does not mitigate the effect of weakly held satisfaction; rather, the most vulnerable customers are those who evidence weakly held satisfaction judgments, are long standing, are responsible for a large volume of business, and had prior positive experiences. Overall, the findings illuminate mechanisms that may govern the translation of satisfaction into loyalty and contribute to a better understanding of the satisfaction–loyalty conundrum. The results also indicate that (1) there is a lot more information in what is being measured and (2) decomposing satisfaction scores into level and strength increases the validity of satisfaction scores.

There are limitations to this research. In Study 1, we relied on secondary data; therefore, there is a loss of control over the data collection and the scales used to measure the various constructs (for a discussion of measurement issues in the context of corporate customer satisfaction measurement programs, see Wittink and Bayer 1994). There are variables we did not include in the study that could be beneficial in securing a better understanding of the antecedents of satisfaction. For example, it is likely that territory managers differ in their ability to motivate and support representatives, which may translate into customer satisfaction. Although we controlled for territory effects in the estimation, incorporating these kinds of differences may have improved our understanding of satisfaction level and strength even more. In Study 2, we used data from a cross-sectional design based on retrospective reports of service complaints. Although this has been the norm for consumer postpurchase studies, problems of recall bias could have influenced the results.

Across both studies, although our results illuminate the satisfaction–loyalty link in terms of psychological loyalty, we did not focus on behavioral loyalty. However, it is important to recognize that focusing on only behavioral loyalty can also be problematic because behavioral loyalty without psychological loyalty may also be fragile. This issue is not trivial, especially in the case of contractural buyer–seller relationships. Supplier firms that are interested in anticipating contract renewal must center on the distinction between “truly loyal” customers, who will continue to use and want to use a service provider, and “trapped” customers, who may continue to use but do not want to use a service provider (see Jones and Sasser 1995). The results we present in this article indicate that a focus on psychological loyalty enables researchers to develop early warning systems that may better inform the issue of customer defection.

Our analysis highlights the problems associated with focusing on the central tendency and ignoring the inherent variability in responses. A practitioner who focuses on the average satisfaction is likely to be “blindsided” when customers who have prior positive experiences and profess high levels of satisfaction switch when an opportunity arises. This is the essence of customer vulnerability, and it illuminates the satisfaction–loyalty conundrum. The satisfaction uncertainty that we have unveiled is akin to uncovering termites that flourish within the walls of a house that otherwise appears solid but is actually vulnerable, and when push comes to shove, the seemingly solid house comes tumbling down. Uncertainty and weakly held judgments promote vulnerability, and practitioners would be wise to assess simultaneously both the level and the strength in stated customer judgments. Therefore, it may be premature to abandon satisfaction programs, as Reichheld (2003) advocates, simply because satisfaction does not always have a strong main effect on loyalty; the answer lies in more comprehensive analysis of satisfaction scores.

In this research, we advance and find support for the notion that customer vulnerability emerges from covert uncertainty about stated satisfaction. Customers may profess that they are satisfied with a service provider, but they differ in the covert strength with which they hold these satisfaction judgments. We are not the first to suggest that service providers need to be cognizant of the strength associated with customer judgments. For example, Rust and colleagues (1999) illustrate the value of centering on customer uncertainty in a services context. However, they maintain that because of questionnaire length constraints, it may not be practical for managers to include uncertainty questions on satisfaction surveys. Instead, Rust and colleagues suggest that proxy measures can be used (e.g., extent of prior experience) to control for uncertainty effects. Our research responds to and extends this view by employing an easy-to-use framework to identify and estimate the uncertainty that is inherent in a stated customer sentiment. We uncovered that service attribute quality and the various actions that constitute ongoing relationships with suppliers shape covert satisfaction strength. Thus, service providers need to recognize that extent of prior experience captures only a small part of the uncertainty story; evolving perceptions of ongoing service interactions and service recovery actions inexorably shape customer uncertainty.

In this study, we unveiled the value of centering on the strength with which people hold stated satisfaction judgments. We believe that there is great value in monitoring over time the strength with which customers hold other judgments of relationship quality (e.g., trust) because of the profound impact of judgment strength on customer behavior. Customer uncertainty, which can be gleaned through appropriately decoding stated customer judgments, destabilizes relationships. Such information may be useful in developing strategies to target vulnerable customers with a view to stem or even reverse the seemingly inexorable customer defection process.
More insights into consumer behavior can be secured by focusing on the strength with which other customer sentiments are held. For example, on the basis of the findings in this research, we might conjecture that the purchase intention–behavior link is weaker when the uncertainty inherent in a purchase intention judgment is high. Therefore, explicitly incorporating intention uncertainty may enable researchers to obtain better forecasts of actual purchase behavior from purchase intention data and shed more light into the intention–behavior link.

As with most consumer phenomena, vulnerability is likely to evolve over time. The resulting dynamics from the service provider’s point of view can be best characterized as customer attrition, or the slow destruction of the relationship. Financial institutions are well aware of this phenomenon. For example, Royal Bank of Canada recognizes that customers close their accounts over time, but it finds it difficult to “identify the early warning signals when a customer relationship is just starting to deteriorate” (Khirallah 2001, p. 7). A simultaneous investigation of the level and strength of stated customer judgments is likely to shed more light on the drivers of customer vulnerability and the why of customer behavior. Further research might also want to investigate the strength of key customer judgments as multiple failures occur and service providers attempt to recover from these failures. For example, how long does the uncertainty in satisfaction last, and what causes it to dissipate or aggravate over time? In the current research, we found that even after one service failure, there was significant uncertainty. Longitudinal research will add to a better understanding of the dynamics we have identified. We look forward to this development in both literature and practice.

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