

The Effect of Group Interactions on Satisfaction Judgments: Satisfaction Escalation

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This study investigates how people's satisfaction judgments are modified after they interact with other group members. It integrates research on customer satisfaction and social influence to develop hypotheses about how an individual's satisfaction is influenced by discrepancies between her expectations about the satisfaction of other group members and their actual opinions as revealed in group discussion. It also considers how this effect is moderated by the individual's susceptibility to social influence and perceptions of group cohesiveness. Two empirical studies demonstrate significant social influence effects on satisfaction judgments in groups. Study One analyzes group satisfaction data collected over time using a mixed-effects regression. It shows that an individual's perceived discrepancy between others' satisfaction judgments and expected group satisfaction has an important influence on her postdiscussion satisfaction judgments. Moreover, individuals discount the pre-discussion satisfaction judgments of other group members in favor of perceived satisfaction and its discrepancy with expectations. Group cohesiveness accentuates the perceived discrepancy with expected group satisfaction. Study Two analyzes survey data from dyads drawn from a cross-sectional sample of organizational buyers who purchase from the same supplier. It models the decision maker's satisfaction with a service supplier as a function of end-user satisfaction. It shows that social influence effects exist in purchasing groups within organizations. Both studies demonstrate that individual-level postdiscussion satisfaction judgments tend to become more extreme, a phenomenon we call *satisfaction escalation*.

Key words: satisfaction; social influence; organizational buying decisions; group cohesiveness; escalation

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1. Introduction

This paper proposes and empirically tests a conceptual framework that investigates how group interactions influence, over time, the satisfaction of individual buying group members. It focuses on an individual's satisfaction with purchased products (goods or services), such as a production manager's satisfaction with a supplier or a family member's satisfaction with a vacation package. Few published studies have considered the multiperson nature of purchase decisions and its impact on satisfaction (e.g., Bowman and Narayandas 2004, Patterson et al. 1997, Qualls and Rosa 1995). Moreover, prior satisfaction research has not investigated how the expressed and implicit opin-

ions of others influence an individual group member's satisfaction judgments. This neglect is surprising given the widespread occurrence of multiperson purchases and consumption—especially in organizational buying contexts.

Our primary research questions are (1) How does buying-group interaction cause individual members to revise their satisfaction judgments? and (2) What is the net social influence effect in an organizational buying situation? We report on two studies that consider the influence of group membership and discussion on satisfaction judgments, thereby extending customer satisfaction research beyond its traditional focus on individuals' expectations and perceptions of

product performance attributes. Drawing on group effects of social identity theory, we predict that an individual's satisfaction with a product or service changes over time due to discrepancies between his or her expectations of other group members' satisfaction and the satisfaction that they reveal in group discussion, where this effect is moderated by the individual's susceptibility to social influence. We develop and estimate a mixed effects model that confirms our predictions—after controlling for the individual's pre-discussion satisfaction judgment and his or her confidence in that judgment. In addition, we find that group membership can lead to biased individual-level perceptions of the satisfaction of other group members, which in turn leads to an escalation of satisfaction judgments. Moreover, we find that group cohesiveness moderates these judgments.

The following three sections describe a conceptual framework for satisfaction updating due to group membership and discussion, present testable hypotheses, and specify our model. Then, we describe the empirical work, which consists of two studies. In Study One, we capture the perceptions and satisfaction judgments of students evaluating an instructional software product, before and after group discussion. This approach facilitates a detailed analysis of satisfaction updating and hypothesized social influence effects, and utilizes a mixed-effects regression to account for possible dependencies in the data due to individuals being part of a group. In Study Two, we model managers' perceptions and satisfaction judgments in the context of an organizational buying decision for an ongoing service. This approach allows us to look beyond single-episode satisfaction updating and to assess social influences on the cumulative satisfaction judgment of decision makers representing a buying group. Finally, we identify opportunities for additional research on a variety of group decision processes where satisfaction judgments are relevant, and we discuss measurement and modeling challenges for firms seeking to understand customer satisfaction's relationship to organizational decisions.

2. Theoretical Background and Group Satisfaction Framework

2.1. Conceptual Overview

Buying groups are commonplace across a variety of organizational and consumer purchase situations. Family members jointly determine purchases for a wide range of products, and purchases by individuals are often influenced by social references (e.g., Davis 1976, Grewal et al. 2004). Organizational purchasing frequently involves multiple decision participants playing different roles, even when an individual manager makes the ultimate decision (e.g., Wilson et al.

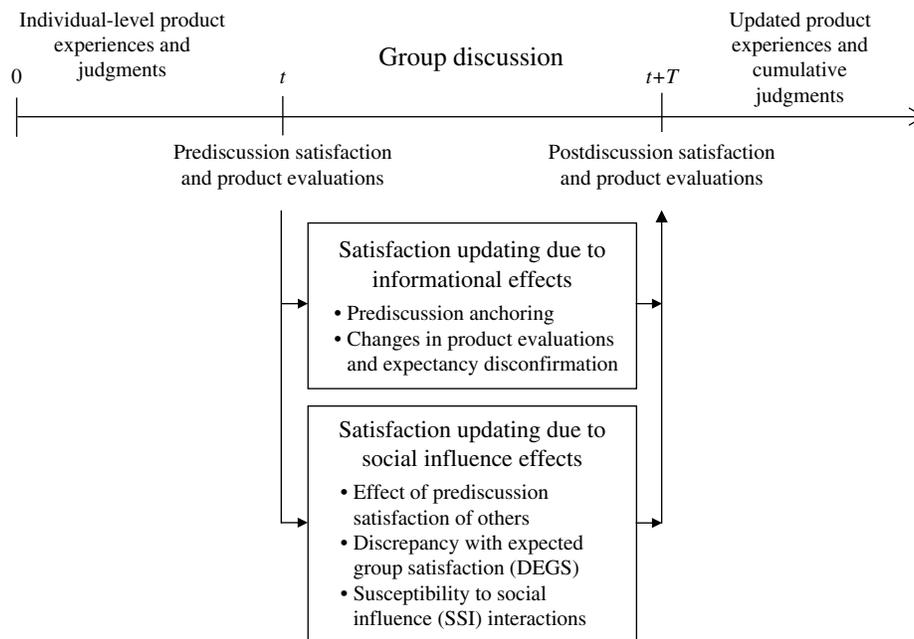
1991). For example, a purchasing manager deciding whether to renew a contract with a preferred supplier will interact with other members of the organization who are users of the contracted services or goods, and who provide inputs based on their functions and expertise. Research in business-to-business markets suggests that the relative weights of satisfaction components differ when multiple attributes are used to make satisfaction judgments (Patterson et al. 1997, Qualls and Rosa 1995). Given that buying-group participants employ different evaluative criteria, a process perspective on how individual satisfaction judgments are formed and integrated can improve our understanding of group purchase behavior.

Much of the multiperson research in organizational purchasing has focused on combining multiple informant data (Kumar et al. 1993, Van Bruggen et al. 2002). Bowman and Narayandas (2004), for example, incorporate multiple buying-group members to link product attribute performance and satisfaction to purchase response. Recognizing that buying-group members have knowledge on different attributes, methods to combine informant data are important. However, the process whereby individual group members discuss and influence each others' satisfaction judgments is not well understood. What are the determining factors that explain how satisfaction is modified in the buying group? Our conceptual framework and empirical studies incorporate social influence effects to address this question and examine the multiperson context of satisfaction.

The process of customer satisfaction formation is typically explained by the expectancy disconfirmation paradigm (e.g., Anderson and Sullivan 1993, Oliver 1980). When product performance is below (above) an expected level based on some desired goal, customers experience negative (positive) disconfirmation leading to decreased (increased) satisfaction. Recent studies have focused on dynamic models of satisfaction formation (Bolton 1998, Mittal et al. 1999) with explicit treatment of multiple attributes for consumer and organizational purchases (Bowman and Narayandas 2004, Mittal et al. 1998, Oliver and Burke 1999, Slotegraaf and Inman 2004). Our group satisfaction framework complements recent models of dynamic, multiattribute satisfaction by incorporating social influence effects that can cause satisfaction updating over time.

Our fundamental premise is that buying-group discussion and the expressed opinions of others shape the satisfaction judgments of individual group members. We assume that prior to discussing products or services in group settings, individual group members hold satisfaction judgments based on prior experience, and that their perceptions of attribute performance and overall satisfaction judgments are shared

Figure 1 Group Satisfaction Process Framework



during group discussion. After discussion, we predict that individual satisfaction levels will change due to the influence of two processes illustrated in Figure 1.

First, we expect that individual group members will revise their perceptions of attribute performance based on attribute information that is revealed in group discussion, consistent with an anchoring and adjustment process (Hogarth and Einhorn 1992). This process is highly similar to the way in which people’s perceptions change when they directly observe attribute performance changes. As illustrated by the “Informational effects” box of Figure 1, the new information produces satisfaction updating as predicted by the traditional satisfaction (expectancy disconfirmation) paradigm (Anderson and Sullivan 1993, Oliver 1980).

Second, and independent of changes brought about by attribute performance information, we expect that a group member’s satisfaction is influenced by social effects related to the opinions of other group members and perceived group norms. As illustrated in the “Social influence effects” box of Figure 1, we consider three social factors that lead to satisfaction updating: an individual’s perception of the satisfaction judgments of other group members shared in discussion (related to the group norm); the discrepancy between these shared opinions and the individual’s prediscussion expectations of others’ satisfaction; and the moderating effects of the individual group member’s susceptibility to social influence. We also consider group cohesiveness (not included in the figure) because of its influence in shaping how group judgments and opinions are perceived.

For example, a manager involved in a repeat purchase decision may find that his expectations regarding group satisfaction with a particular supplier are more pessimistic than the opinions shared by others during discussion. The manager is likely to adjust his satisfaction levels—even if no new supplier information arises during the discussion—because he values relationships with colleagues and their opinions. The manager’s satisfaction updating is driven by a sense of belonging to the group and the influence that being part of the group exerts on judgments about the supplier. Our framework thus supplements prior satisfaction models because it incorporates social influences that operate directly on an individual’s satisfaction judgments beyond the effects of product performance expectations and perceptions.

2.2. Social Influence Effects

Social influence in groups is framed in terms of informational and normative influences (Kaplan and Miller 1987). *Informational influence* is “based on the acceptance of information from others as evidence about reality” (Kaplan and Miller 1987, p. 306). If information is shared during group discussion and product evaluations are revised as new information is revealed, this constitutes informational influence on a group member’s judgments. In contrast, *normative influence* is “based on the desire to conform to the expectations of others” (Kaplan and Miller 1987, p. 306). There are two general effects of normative influence: public compliance and private acceptance. Normative influences of compliance relate to rewards or punishment, and primarily affect public expressions of opinion in group settings (e.g., Kelman 1961).

In our framework of satisfaction updating, the relevant normative influences operate on the privately held judgments of individual group members who desire to identify with, or be viewed favorably by, other group members. Individuals who value the opinions of other group members will tend to anticipate others' judgments and scrutinize their own opinions against the perceived group norms implied by the group judgments. As group discussion reveals the judgments of others, individuals are normatively influenced and shift their opinions to better align with the relevant judgments of others and reflect the group norm.

Normative Influence and the Role of Social Identity. Our understanding of normative influence as it relates to privately held judgments arises from social identity theory (Abrams et al. 1990, Kelman 1961, Turner et al. 1989). Social identity theory posits that, as part of self-concept, individuals hold various social identities that are derived from perceived membership of groups, such as families or organizational buying groups (Hogg and Vaughan 2002). Moreover, the theory asserts that group membership engenders self-appraisal situations that lead to a strong favoring of judgments and norms associated with the group (Tajfel and Turner 1979). Once people self-categorize as members of valued groups, they often seek to enhance their self-worth by adopting positions that align with group norms for beliefs and behaviors. In the context of buying groups, the group norms include opinions about the products, services, or suppliers under consideration for a purchase decision. The theory identifies three contributing factors for an individual's favoring of within-group norms. First is the extent to which belonging to the group becomes an aspect of the individual's self-concept, which in many organizations is brought about by officially naming individuals to buying groups and incorporating group membership into job descriptions. Second is the extent to which the prevailing context (e.g., group discussion) reveals group norms and other members' judgments, which is commonplace in buying groups because of their expressed purpose—to share opinions and reach actionable decisions. The final factor is the perceived importance of group decisions as shaped by the identity relationships within the group. Buying-group decisions are typically important because they are linked to business objectives and outcomes, such as improved quality or better profits. Social identity theory argues that individuals are most likely to be influenced by groups when membership is central to their self-definition, when the group judgments are meaningful, and when group decision outcomes are made equivocal by factors such as market conditions or implementation issues not fully under the group's control.

Implications for Satisfaction. The satisfaction judgments of organizational buying groups are particularly susceptible to social influence effects because the accountability for buying decisions is shared by group members, the decisions are organizationally meaningful, and the judgmental nature of group purchase decisions lacks demonstrably correct answers (i.e., the true outcome is not known a priori). We therefore expect that belonging to a buying group will result in social identity influences on an individual's product or service satisfaction judgments. In the next two sections, we describe how satisfaction judgments are influenced by group discussion and specify testable hypotheses based on social identity effects. The hypotheses focus on the social influence factors that distinguish our group satisfaction framework from the more typical satisfaction antecedents related to performance expectations and attributes. Ultimately, we present a model that relates postdiscussion satisfaction judgments of individuals to their prediscussion judgments and to the social factors that emerge in group interactions.

3. Hypotheses About How Groups Influence Individual Satisfaction

3.1. Prediscussion Expectations and Expressed Group Opinions

Our first set of hypotheses relate to the direct effects of group judgments and norms on satisfaction updating. Social identity theory closely links social influence to perceived group norms, which are related to the judgments of others in the group (e.g., Bearden et al. 1989, Kelman 1961). Perceived group norms, however, are seldom equivalent to the straightforward aggregation of the actual prediscussion judgments held by others (Abrams et al. 1990, Turner et al. 1989). An individual's sense of identification with the group's norms is not based simply on the objective reality of others' opinions, but rather on how the expressed opinions of other group members align with the individual's expectations (e.g., Abrams et al. 1990). Because most buying-group members value belonging to the group, we believe they form expectations of what others will say during group discussion and compare those expectations to what is actually discussed. We define the term *discrepancy with expected group satisfaction* (DEGS) as an individual's assessment of how much, and in what direction, the satisfaction expressed by other group members differs from what she expected. The satisfaction expressed by others can be higher or lower than expected, so DEGS can be positive or negative. Although subjective discrepancy related to product preferences has been studied in group decisions (Bohlmann and Qualls 2001), its effect on the

satisfaction judgments of individual group members has not been examined.

We thus have two social influence effects related to social identity and group norms. First is a direct normative influence of the group norms that are implied by the prediscussion satisfaction judgments expressed by others. The second effect relates to how the group norm compares to expectations, or DEGS in our context of satisfaction judgments. We stress that DEGS is an individual's subjective assessment of how the judgments of others align with what was expected, and that the perceptions and expectations may or may not be consistent with the judgments actually expressed by others. The satisfaction judgments of others may signal the group norm during discussion, but DEGS may have a stronger influence (Abrams et al. 1990). Specifically, we hypothesize the following:

HYPOTHESIS 1A (H1A). *A positive (negative) discrepancy with expected group satisfaction will increase (decrease) an individual's postdiscussion satisfaction judgment (i.e., a main effect).*

HYPOTHESIS 1B (H1B). *Individuals will update their satisfaction judgments in the direction of the prediscussion satisfaction judgments expressed by other group members (i.e., a main effect).*

3.2. Susceptibility to Social Influence

Individuals may vary on how strongly they identify with the group and adopt group norms. An individual who identifies strongly with the group is more likely to adopt others' opinions than is an individual who identifies weakly (Turner et al. 1989). We define *susceptibility to social influence* (SSI) as a group member's self-assessed predisposition to be influenced by and adopt perceived group norms. High susceptibility individuals are more likely to adjust their satisfaction judgments in accordance with group norms. Social identity theory holds that identifying with group norms is closely linked to perceived discrepancies between expressed judgments and what was expected (H1A). Thus, we expect

HYPOTHESIS 2 (H2). *The greater an individual's susceptibility to social influence, the greater the effect of discrepancy with expected group satisfaction on his postdiscussion satisfaction judgment (i.e., a moderator effect).*

Susceptibility to social influence may also moderate the effect on an individual's satisfaction updating exerted by others' actual satisfaction judgments. Social identity theory distinguishes between derived (perceived) group norms and the opinions actually expressed by other group members. A group member who strongly identifies with the group and is susceptible to social influence may attach more or less weight to the actual opinions of others, influenced by her perceptions of the group norms and

how the norms align (or not) with others' actual satisfaction. Whereas judgments revealed in discussion can signal appropriate norms, the actual opinions of others may in fact be discounted in favor of previously held perceived group norms, particularly when identifying with the group is highly important to the individual (Abrams et al. 1990, Turner et al. 1989). The direct effect of others' prediscussion satisfaction is that it positively influences satisfaction updating (H1B). However, the moderating influence of SSI may be positive or negative, such that we offer no formal hypothesis and explore its significance in conjunction with the empirical results.

3.3. Perceptual Bias and Group Cohesiveness

A remaining question focuses on how group members perceive the satisfaction of others as they compare expectations with what is revealed in discussion to derive or interpret the group norm. Two factors are at play in this process. Research has shown that people expect the judgments of others to be similar to their own judgments (e.g., Davis et al. 1986), and that individuals are likely to bias their interpretation of others' opinions in the direction of their own prior expectations (Abrams et al. 1990, Edwards and Smith 1996, Russo et al. 1996). Individual group members perceive group norms based on their expectations, and so they will consequently perceive DEGS as more extreme than what is merited by the satisfaction judgments that are actually expressed by others. In other words, an individual's perceived discrepancy with expected group satisfaction is likely to be biased, in that DEGS is positively influenced by expectations. Furthermore, research suggests that this biased perspective will be more prevalent in highly cohesive groups (Mackie 1986, Turner et al. 1989). Thus, we expect that individuals who sense high group cohesiveness will perceive the expressed satisfaction of other group members to be even more extreme than their expectations, so that their final interpretation of what was revealed will diverge dramatically from what others believe.

HYPOTHESIS 3A (H3A). *Individuals with more positive (negative) expectations of others' satisfaction will perceive a more positive (negative) discrepancy with expected group satisfaction.*

HYPOTHESIS 3B (H3B). *Individuals who perceive high group cohesiveness will perceive a more positive (negative) discrepancy with expected group satisfaction when they expect other group members to be satisfied (dissatisfied).*

3.4. Satisfaction Escalation

The reliance on perceived judgments that is brought about by social influences in a group setting reveals several interesting phenomena about satisfaction updating. First, perceptions may be biased or distorted by prior expectations, particularly in highly

cohesive groups (H3A, H3B). Second, if the perceived DEGS is extreme, the more positive (or negative) DEGS will translate into more positive (or negative) postdiscussion satisfaction (H1A). Third, if an individual is susceptible to social influence, the effect of an extreme DEGS perception on satisfaction judgments will be enhanced (H2). We call the net result *satisfaction escalation*, where an individual's postdiscussion satisfaction judgments become more extreme due to self-confirming perceptions of the satisfaction expressed by other group members.

An extreme shift in satisfaction judgments due to social influence is a type of group polarization—the adoption of attitudes that are more extreme than, but in the same direction as, the group's mean prediscussion opinion (Mackie 1986). Our hypotheses and their implications for satisfaction escalation are consistent with the prevailing view of group polarization as informed by social identity theory. Opinions polarize as individuals seek to adopt or conform to group norms that they perceive as being more extreme than they are in objective reality (Abrams et al. 1990, Mackie 1986). Our group satisfaction framework thus relates satisfaction escalation to a biased perception of others' satisfaction as compared to expectations.

4. Model Specification

This section develops an equation describing postdiscussion satisfaction formation over time. We begin by specifying a base model of individual-level satisfaction formation that provides a context for the operation of group influence factors. The base model incorporates antecedents of satisfaction established by prior research that must be controlled in the testing of our hypotheses. Subsequently, we introduce the group influence factors.

4.1. Base Model: New Information from Group Discussion

Prediscussion Anchors and the Role of Confidence. In line with past research on satisfaction revision (e.g., Bolton 1998, Johnson et al. 1995, Mittal et al. 1999), we model the updating of satisfaction judgments as an anchoring and adjustment process (Hogarth and Einhorn 1992). An individual's prediscussion anchors are his expectations regarding attribute performance and his satisfaction judgments. Individuals adjust their prior satisfaction judgments as new information is revealed in group interaction. Hence, our model begins with the well-established notion that individuals exhibit a strong tendency to interpret new information in a manner that is consistent with their prior expectations (Boulding et al. 1993, Oliver and Burke 1999, Oliver and Winer 1987). Moreover, individuals who are confident in their

opinions may become more firmly established in their prior preferences. Greater confidence (or less uncertainty) in prediscussion judgments generally corresponds to greater emphasis on the prior anchor and relatively less adjustment of opinion (Hogarth and Einhorn 1992, Rust et al. 1999). Pre-existing confidence in personal judgment can also lead to more extreme positions due to confirmatory biases or the affirmation of confidently advocated beliefs in group discussion (e.g., Brauer et al. 1995). The implication is greater weight attached to prediscussion satisfaction by more confident group members.

New Information Revealed by Group Discussion. Group discussion may reveal new information that affects perceptions of attribute performance and expectancy disconfirmation. Because perceptions of attribute performance are antecedents of satisfaction, any new information gained from group discussion should lead individuals to revise their attribute perceptions, and (ultimately) to adjust their satisfaction judgments (Johnson et al. 1995, Mittal et al. 1999). Specifically, as an individual's perceptions of attribute performance become more favorable (unfavorable) due to group discussion, her postdiscussion satisfaction will become more favorable (unfavorable). In addition, revisions to expectancy-disconfirmation will also influence satisfaction when the individual's revised perceptions are compared to prior expectations (e.g., Boulding et al. 1993, Johnson et al. 1995). Specifically, as a group member's expectancy disconfirmation increases (decreases) due to new information, the individual's postdiscussion satisfaction judgment will increase (decrease). These effects of revised perceptions of performance and expectancy disconfirmation should be interpreted under *ceteris paribus* conditions; i.e., perceptions of performance and expectancy disconfirmation influence postdiscussion satisfaction after controlling for prediscussion expectations.

Baseline Model. Algebraically, we begin developing our satisfaction model with a generic formulation of Anderson and Sullivan (1993), who posited satisfaction at time t (SAT_t) as a function of product performance evaluations ("quality") and expectancy disconfirmation ($EVAL_t$ and $EXPDIS_t$, respectively). For simplicity, assume a linear additive form

$$SAT_t = c_0 + c_1EVAL_t + c_2EXPDIS_t. \quad (1)$$

Subtract satisfaction at a prior time period from both sides of Equation (1) and rearrange:

$$SAT_t = k_0 + k_1SAT_{t-1} + k_2(EVAL_t - EVAL_{t-1}) + k_2(EXPDIS_t - EXPDIS_{t-1}). \quad (2)$$

Letting the time periods denote the beginning and end of group discussion, Equation (2) expresses postdiscussion satisfaction as a function of a prediscussion satisfaction anchor and the changes in performance evaluations and expectancy disconfirmation due to discussion.¹ Finally, adding the confidence effect that attaches greater weight to the prediscussion anchor, and dropping time subscripts, our base model to estimate postdiscussion satisfaction is:

$$SAT_i = \beta_0 + \beta_1 SAT_i^0 + \beta_2 CONF_i \times SAT_i^0 + \beta_3 CONF_i + \beta_4 (\Delta EXPDIS_i) + \sum_k \beta_{k+4} (\Delta EVAL_{ik}) + \varepsilon_i. \quad (3)$$

Subscript i refers to the group member and subscript k denotes a particular product performance attribute; SAT_i and SAT_i^0 are the group member's post- and prediscussion satisfaction judgments, respectively; $CONF_i$ is the group member's confidence level; $\Delta EXPDIS_i$ is the change in performance expectancy disconfirmation due to group discussion; and $\Delta EVAL_{ik}$ is the change in performance evaluations for each of the product attributes.

4.2. Extension to Include Group Effects on Postdiscussion Satisfaction

We specify our model of how satisfaction judgments change after group discussion due to the effects of DEGS and other social influence factors by expanding Equation (3):

$$SAT_i = \beta_0 + \beta_1 SAT_i^0 + \beta_2 CONF_i \times SAT_i^0 + \beta_3 CONF_i + \beta_4 DEGS_i + \beta_5 SAT_j^0 + \beta_6 SSI_i \times DEGS_i + \beta_7 SSI_i \times SAT_j^0 + \beta_8 SSI_i + \beta_9 (\Delta EXPDIS_i) + \sum_k \beta_{k+9} (\Delta EVAL_{ik}) + \varepsilon_i. \quad (4)$$

$DEGS_i$ is the individual's sense of discrepancy between the satisfactions revealed by other group members and his or her expected group satisfaction; SAT_j^0 is the average prediscussion satisfaction of other group members j in the group, $j \neq i$; SSI_i is the individual's susceptibility to social influence; and other variables remain as defined earlier. The additional social influence terms in Equation (4) follow directly from the hypothesized relationships. Postdiscussion satisfaction is influenced by DEGS (H1A), the actual satisfaction judgments of others (H1B), and susceptibility to social influence interactions with DEGS (H2)

and others' satisfaction, after controlling for prediscussion anchors, confidence, and the effects of new information. All hypothesized effects are expected to be positive; the sign of the SSI_i and SAT_j^0 interaction is not hypothesized. We do not predict the sign or significance of the confidence and influence susceptibility main effects, which are included to accurately account for their specified interactions (Irwin and McClelland 2001).

We will conduct separate analyses of the DEGS perceptions to test H3A and H3B.

5. Study One: Satisfaction with Instructional Product Software

5.1. Study Context and Collection of Longitudinal Data

A marketing simulation is the focal product of our first empirical study. The simulation was used as part of a group assignment in an undergraduate marketing course at a Midwestern university. The semester-long assignment allows for all group members to have relevant experiences on which to base their evaluations and satisfaction with the product, and to offer recommendations for its future use. To examine changes in satisfaction over time due to group decision processes, respondents were surveyed in three stages after completing the assignment, as illustrated in Figure 1. (Table A.1 in the appendix summarizes the measures.) First, the prediscussion evaluations and satisfaction ratings were collected for individual respondents (time t in Figure 1). Second, individuals met as a group to freely discuss the simulation and jointly recommend whether it should be used in the future. Groups took as much time as needed to arrive at a recommendation. Third, the postdiscussion evaluations and satisfaction ratings of individual respondents were collected (time $t + T$ in Figure 1). The data contain relevant pre- and postdiscussion ratings from individuals to assess updating due to social influence.

The study used 178 undergraduate students. After eliminating 26 students due to missing data, the final sample consisted of 152 students in 39 groups. Most students were part of a four-person group (27 groups), with eight 3-person and four 5-person groups.² Students provided all survey responses confidentially, so that their evaluations did not influence their grade; the instructor received survey data with no student identifiers. Team codes were used to link individual responses to group data.

¹ See Slotegraaf and Inman (2004) for a satisfaction model formulation over multiple time periods and for multiple product attributes.

² Although group size is sometimes a covariate, our sample does not include sufficient variance to analyze group size effects, and its influence is not significant in our statistical analyses.

5.2. Measures and Descriptive Statistics

Perceptions of Product Attribute Performance. Subjects evaluated various pedagogical characteristics³ of the group assignment using 10-point agree/disagree scales (0 = “strongly disagree” and 9 = “strongly agree”). Factor analysis of the subjects’ prediscussion responses for 12 items reveals three factors (eigenvalues of 5.10, 1.70, and 1.02). Based on the factor loadings, three attribute scales are identified (see appendix, Table A.2): value of the group experience (GROUP), lessons learned about marketing (LEARN), and effort required by the assignment (EFFORT). Attribute scores are calculated as the average of their scale item ratings.

Satisfaction Judgments and Confidence. Satisfaction is measured as the average rating of two items on a 10-point agree/disagree scale: (1) Overall, I am satisfied with my team’s experience in preparing for the simulation assignment; (2) Overall, I am satisfied with the lessons learned from the simulation assignment. Pre- and postdiscussion satisfaction ratings were taken for individual group members (correlation of the two items is 0.62 prediscussion, and 0.51 postdiscussion, $p < 0.001$). The satisfaction of others in the group is the satisfaction ratings averaged across the other group members. Using a 10-point agree/disagree scale, subjects also rated “I am confident in my response” for each of the two satisfaction items (correlation = 0.49, $p < 0.001$). Confidence in prediscussion satisfaction judgments is measured as the average rating.

Expectancy Disconfirmation. A subject’s expectancy disconfirmation related to product performance is measured as the average rating of two items on a 10-point agree/disagree scale: (1) My overall experience with the team in preparing the simulation assignment exceeded my expectations; (2) The value of what I learned from the simulation assignment exceeded my expectations. The use of subjective measures to represent an overall assessment of expectancy disconfirmation is well established in satisfaction research (Oliver 1980, 1997; Tse and Wilton 1988). Expectancy disconfirmation was measured both pre- and postdiscussion (correlation of the two items is 0.63 prediscussion, and 0.76 postdiscussion; $p < 0.001$).

Discrepancy with Expected Group Satisfaction. To measure DEGS, we asked individual group members after the group discussion to rate the satisfaction of the other group members compared to what

they expected before discussion. Ratings were given for both satisfaction dimensions (overall satisfaction with the group experience and the lessons learned) on a 10-point scale, where 0 = “much more dissatisfied than expected” and 9 = “much more satisfied than expected” (item correlation is 0.85, $p < 0.001$). DEGS is measured as the average of the ratings across both dimensions, minus the scale midpoint of 4.5 (the “as expected” rating) such that positive (negative) values represent a positive (negative) perceived discrepancy. The discrepancy measure gives group members’ overall subjective evaluation of how other group members’ satisfaction levels—as perceived in discussion—differed from what was expected.

Before discussion, subjects indicated the satisfaction levels they expected from their other group members, measured with 10-point agree/disagree scales for both satisfaction items (item correlation is 0.81, $p < 0.001$). We compute an objective discrepancy as the calculated difference between the average expected and actual prediscussion satisfaction levels of other group members (Oliver 1980, Tse and Wilton 1988). Comparable to the subjective DEGS measure, this objective discrepancy is zero if a subject’s prediscussion expectations match, on average, the actual satisfaction of other group members, and positive (negative) if other group members are more (less) satisfied than expected. Note that the calculated objective discrepancy simply provides a point of comparison for the DEGS perceptions. As a difference score, the objective discrepancy may be problematic when analyzed in conjunction with its components (Peter et al. 1993), such that a subjective DEGS measure is preferred.

Susceptibility to Social Influence. We measure an individual’s susceptibility to social influence using the normative component of the consumer susceptibility to interpersonal influence (CSII) scale of Bearden et al. (1989). The CSII scale measures a predisposition to being influenced by others when making purchase decisions, with both an informational (four-item scale) and normative (eight-item scale) component. Because our interest is in the influence of others’ overall satisfaction judgments, the normative aspect of CSII is the relevant scale, incorporating influences related to social identification.⁴ As a trait not specific to the group decision itself, we measured social influence susceptibility several weeks prior to group discussion

³ The assignment attributes are based upon characteristics used in similar studies of group assignments (e.g., Glazer et al. 1987), and a pretest survey for a group assignment in a different undergraduate class.

⁴ We checked whether adding the informational component of CSII contributes to our satisfaction updating model, and found no significant effects. This result is expected because the informational effects of product evaluations are included directly via the changes in performance evaluations and expectancy disconfirmation.

(α reliability = 0.91) to avoid potential confounds with group decision influence.

Group Cohesiveness. We measure group cohesiveness perceptions for each subject using a slightly modified version of the Seashore (1954) scale (see also Norris and Niebuhr 1980). The prediscussion measurement relates to group cohesiveness in the group's assigned task, and not the group process of reaching consensus satisfaction judgments. The Seashore scale uses two 5-point items related to the subject feeling part of the group and desiring not to switch out of the group, and three 3-point items assessing the way group members get along together, stick together, and help one another out. Our measure is the sum of the standardized responses for each item (standardized reliability coefficient = 0.69).

Descriptive Statistics. Table A.3 in the appendix shows descriptive statistics and correlations for the variables of interest. Subjects, on average, are positive toward the simulation product. Before discussion, only eighteen subjects (11.8%) disagreed that they were satisfied with the simulation, with the mean satisfaction rating for all subjects being 6.75 out of 9 maximum points (postdiscussion mean satisfaction rating is 6.85). The average prediscussion evaluations were 6.61 for GROUP, 6.50 for LEARN, and 5.48 for EFFORT. Group discussion caused moderate changes in the evaluations and satisfaction (average ratings changed by 0.17 points or less). The GROUP rating increased significantly ($T = 2.32$, two-tailed p -value = 0.022), while the EFFORT rating decreased ($T = 1.63$, two-tailed p -value = 0.11), and the LEARN rating decreased, but not significantly ($T = 0.58$). Overall satisfaction increased due to group discussion ($T = 1.35$).

5.3. Model Estimation and Results

Equation (4) is our model for updated, postdiscussion satisfaction, with Equation (3) serving as a baseline comparison that ignores the hypothesized social influences. Because each individual is part of a group, we analyze satisfaction using a mixed-effects regression technique (see Hedeker et al. 1994 for an overview). Individual-level analysis should take into account potential dependencies in the data due to individuals being clustered within groups. For individual i in group j , we can write the residual term as

$$e_{ij} = \alpha_j + \varepsilon_{ij}, \quad (5)$$

where α_j is an unknown random cluster (group) effect assumed normally distributed, and ε_{ij} are the independently distributed residuals. A mixed-effects regression model represents the inclusion of a random effect within a typical multivariate regression model, such as Equation (4). Estimation is accomplished by

maximum likelihood utilizing a Fisher scoring solution that jointly estimates the model coefficients and the variance of the random cluster effect. If clustering within groups has little effect on individual satisfaction judgments, estimates of α_j will be near zero with a variance approaching zero (empirical Bayes methods estimate the random effect size α_j). As dependencies caused by group clustering approach zero, the mixed-effects solution approaches that of ordinary least squares.

Model Fit, Model Comparison, and Model Evaluation. Results for the baseline (Equation (3)) and the full social influence (Equation (4)) satisfaction models are shown in Table 1. Variables other than the changes in performance evaluations and expectancy disconfirmation are mean-centered. Diagnostics based on intercorrelations of the variables show no significant multicollinearity. The condition number (square root of the ratio of largest to smallest characteristic root of the correlation matrix) is 2.87, well below the value of 20 where multicollinearity is generally viewed to become problematic (Greene 1990). The highest variance inflation factor (VIF) is 2.07, below the recommended threshold of 10 (Hair et al. 1995). A likelihood ratio test indicates that the full model explains postdiscussion satisfaction significantly better than the baseline model ($\chi^2_5 = 17.84$, $p = 0.003$). Thus, social influence effects play an important role in satisfaction updating within groups. The variance of the random group effect is significant ($\chi^2_1 = 5.49$, $p = 0.02$), representing 18% of the unexplained variance. The mixed-effects regression is thus appropriate for this analysis. Examining the full satisfaction model results, we find the prediscussion satisfaction anchor is significant, as well as its interaction with confidence. Revisions in performance evaluations are significant for two of the three performance attributes, and the change in expectancy disconfirmation is also positive and significant as expected.

Statistical Tests of H1 and H2. The discrepancy with expected group satisfaction (DEGS) is positive and significant (H1A is supported), as is the direct effect of others' actual prediscussion satisfaction (H1B is supported). The DEGS interaction with susceptibility to social influence is positive and significant (H2 is supported). We note, however, that the effects of others' satisfaction (hypothesized main effect and the SSI interaction) are significant at $p < 0.10$. Omitting only the two DEGS terms leads to an inferior model ($\chi^2_2 = 8.95$, $p = 0.011$). Thus, including the discrepancy with expected group satisfaction significantly improves our ability to explain social influences on satisfaction updating beyond the prediscussion satisfaction of others alone.

Table 1 Mixed-Effects Results of Postdiscussion Satisfaction Analysis ($N = 152$)

Independent variable	Expected sign	Baseline model		Full model	
		Estimated coefficient	p -value	Estimated coefficient	p -value
Prediscussion satisfaction anchor	+	0.777 (0.034)	<0.001	0.744 (0.038)	<0.001
Satisfaction anchor and confidence interaction	+	0.055 (0.032)	0.089	0.071 (0.032)	0.025
Confidence		-0.024 (0.058)	0.672	-0.025 (0.056)	0.663
DEGS (H1a)	+			0.081 (0.041)	0.048
Others' actual satisfaction judgments (H1b)	+			0.088 (0.048)	0.068
DEGS and influence susceptibility interaction (H2)	+			0.043 (0.018)	0.015
Others' satisfaction and influence susceptibility interaction				-0.047 (0.025)	0.056
Susceptibility to social influence				0.029 (0.026)	0.255
Change in expectancy disconfirmation	+	0.157 (0.045)	<0.001	0.145 (0.044)	<0.001
Change in GROUP evaluation	+	0.349 (0.062)	<0.001	0.321 (0.061)	<0.001
Change in LEARN evaluation	+	0.134 (0.072)	0.062	0.115 (0.069)	0.095
Change in EFFORT evaluation	-	-0.010 (0.040)	0.805	-0.026 (0.038)	0.494
Constant		6.738 (0.065)	<0.001	6.743 (0.061)	<0.001
Log likelihood		-136.47		-127.55	
Residual variance		0.296		0.267	
Cluster (group) variance		0.075		0.059	

Note. Dependent variable: Postdiscussion satisfaction of individual group members. Estimated standard errors in parentheses.

Discussion of the Satisfaction Model. Overall, the results are as hypothesized. Social influence susceptibility as a moderator increases the weight placed on the perceived DEGS, and decreases the emphasis on others' actual prediscussion satisfaction judgments. The SSI effects are thus consistent with our earlier discussion of how relevant group norms may be more closely linked to the perceived judgments of others than to actual satisfaction levels. Given the estimated coefficient values, the interaction effects with SSI are quite pronounced. Note that the coefficients for the SSI interactions with DEGS and others' satisfaction are nearly the same magnitude but of opposite sign. For illustration, consider high versus low levels of SSI that are \pm one standard deviation from its mean. For low SSI, the level of perceived DEGS has virtually no net effect on postdiscussion satisfaction, whereas postdiscussion satisfaction increases substantially with higher levels of others' prediscussion satisfaction. Under high SSI, the reverse is true, given that the interaction terms are of opposite sign with similar

magnitudes. Individuals with high SSI almost completely discount the actual satisfaction levels of others, and focus instead on the perceived discrepancy with the expected satisfaction levels. These results motivate us to examine DEGS in more detail.

5.4. Detailed Analyses of Discrepancy with Expected Group Satisfaction

Comparison of DEGS with Actual and Expected Group Satisfaction. We conduct a detailed analysis of the perceived DEGS to test H3A and H3B. We begin by comparing the DEGS perceptions with the objective discrepancy (the calculated difference between the actual and expected satisfaction of other group members), and find a negative correlation ($r = -0.32$, $p < 0.001$). As a difference score, the objective discrepancy is best analyzed in terms of its two components (Peter et al. 1993). Absent any perceptual biases among respondents, DEGS should be positively correlated with the actual satisfaction of others and negatively correlated with expected satisfaction

Table 2 Results of Discrepancy with Expected Group Satisfaction Analysis ($N = 151$)

Independent variable	Expected sign	Estimated coefficient	Standard error	p -value
Expected satisfaction of other group members (H3a)	+	0.741	0.064	<0.001
Actual satisfaction of other group members	+	0.259	0.066	<0.001
Interaction of expected and actual satisfaction of other group members		-0.129	0.046	0.006
Group cohesiveness perception		-0.105	0.128	0.412
Interaction of group cohesiveness and expected satisfaction of other group members (H3b)	+	0.221	0.081	0.007

Note. Dependent variable: Postdiscussion measure of DEGS. $R^2 = 0.67$, $N = 151$, omitting one outlier.

of others. As predicted (H3A), however, the perceived discrepancy with expected group satisfaction is positively correlated with the individual's expectations of others' satisfaction ($r = 0.75$, $p < 0.001$). This relationship does not appear to be due to systematically incorrect expectations. Subjects on average "correctly" perceive a more positive discrepancy level with higher actual satisfaction of other group members ($r = 0.49$, $p < 0.001$), and the expected satisfaction is on average not significantly different from others' actual satisfaction ($T = -1.25$). For high (low) levels of expected satisfaction of others, subjects significantly overpredict (underpredict) others' actual satisfaction, as may be expected. The expectations are thus more extreme than the actual satisfaction levels, but still correct on average, despite a significant correlation of expectations and the subject's own prediscussion satisfaction ($r = 0.69$, $p < 0.001$). Overall, the perceptual bias in DEGS is not driven by incorrect expectations, but by individuals perceiving others' satisfaction in light of their prior expectations, consistent with H3A.

We therefore observe two primary effects. First, consistent with the social identity research, individuals expect others' satisfaction levels to be more extreme than they really are. Second, group discussion causes individuals to further perceive others' satisfaction to be more positive under more positive expectations, escalating the DEGS perceptions. These two effects indicate that expected satisfaction is a critical component in subjective assessments of DEGS.

Modeling DEGS to Test H3A and H3B. The positive relationship between perceived DEGS and expectations suggests a form of escalation, where subjects who before discussion think other group members are highly satisfied, perceive after the discussion that others were even more satisfied than expected. Under H3B, this escalation should be more pronounced under high group cohesiveness. To test H3A and H3B, we conduct a regression analysis with DEGS as the dependent variable. Consistent with the definition of DEGS, we include the expected and actual satisfaction of other group members (and their interaction) as independent variables, together with group

cohesiveness and its interaction with the expected satisfaction of others. We attempt a mixed-effects regression treating group as a random effect, and find that the maximum likelihood estimation fails to converge because the random-effect variance approaches zero. Thus, ordinary least squares estimation is appropriate for our analysis.

Results are shown in Table 2 (the analysis uses mean-centered variables; the condition number is 2.24, and the maximum VIF is 1.57, indicating no significant multicollinearity). DEGS is positively related to expectations (H3A is supported) and the actual prediscussion satisfaction of other group members, with a significant negative interaction. We also find that the cohesiveness main effect is not significant, but that its interaction with expected satisfaction is positive and significant. Subjects with high expectations of others' satisfaction escalate DEGS more when group cohesiveness is high (H3B is supported).

To interpret the negative interaction of expected and actual satisfaction of others (a relationship we did not hypothesize a priori), we plot the effects in Figure 2.⁵ Fixing cohesiveness at its average value, Figure 2 plots the DEGS perceptions against the expected satisfaction of others based on the regression results of Table 2. The estimated effects are shown for values that are plus or minus one standard deviation ($\pm s$) from the average. The figure depicts DEGS perceptions for high (low) levels of actual satisfaction of others that are one standard deviation above (below) its mean. Objectively, DEGS should be at its lowest value when expected satisfaction is high and actual satisfaction of others is low. Figure 2 shows that this is not the case, given the positive main effect of expectations. Under high expectations, the DEGS perceptions differ very little, regardless of whether the actual satisfaction of others is high or low. The negative interaction thus implies that a bias in DEGS perceptions may be more pronounced under high expectations, because the reality of others' actual satisfaction is less of a factor.

⁵ See Irwin and McClelland (2001) for a discussion of methods to plot interaction effects.

Summary of Discrepancy with Expected Group Satisfaction Effects. Several factors speak against our findings being caused by survey response or estimation biases. First, we measure DEGS in a manner similar to other subjective discrepancy perceptions in the satisfaction literature (e.g., Oliver 1980, Tse and Wilton 1988). Moreover, DEGS is measured with a scale (“much more dissatisfied than expected” to “much more satisfied than expected”) that differs from expected satisfaction and actual satisfaction (“strongly disagree” to “strongly agree”), and from the statement-based five-point and three-point cohesiveness scale items. Second, a significant demand effect would likely be manifest in systematically inflated expectations in addition to DEGS perceptions. However, this is not the case, because expectations are correct on average. Furthermore, a response-style bias (subjects responding to the DEGS scale in the same inflated way as to the expectations scale) is not evident because the (unadjusted) DEGS ratings are significantly different from ($T = 2.85, p < 0.01$) and are lower than the expectations ratings. Finally, the positive effect of DEGS on satisfaction could be overstated if DEGS is found to be an endogenous variable in the satisfaction analysis. A two-stage least squares analysis with DEGS and its SSI interaction as endogenous does not substantially change the satisfaction results, and a specification test does not support DEGS endogeneity ($\chi^2_2 = 1.47, n.s.$; see Greene 1990).

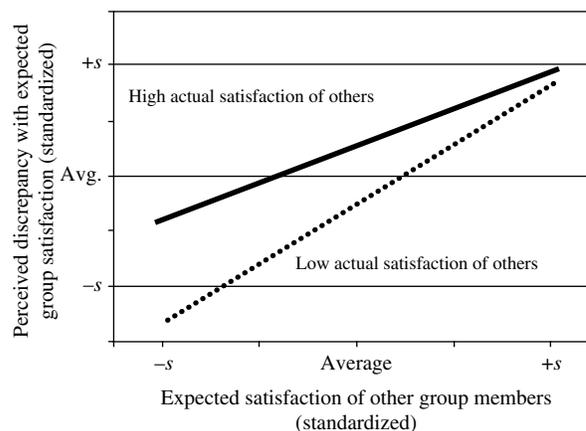
In summary, our first study provides empirical support for our hypotheses of how individual satisfaction is influenced by group factors. DEGS perceptions are inflated under high expectations of others’ satisfaction, particularly for high cohesiveness. The escalated DEGS perceptions in turn influence satisfaction updating, especially for high SSI individuals, *ceteris paribus*. We thus find evidence of satisfaction escalation arising from social influences. To further develop the robustness of our social influence perspective, our second empirical study examines how group effects operate in organizations.

6. Study Two: Service Value Satisfaction

6.1. Overview of the Organizational Buying Context

Study Two investigates group effects for dyads drawn from buying groups in different organizations. We deliberately chose a simple group purchase decision, where one group member is the primary decision maker and a second group member provides input (but has no decision-making authority). This group decision process exists in many organizations, where decisions on whether to continue purchasing services

Figure 2 Effects of Expected and Actual Satisfaction of Others on DEGS



from existing suppliers are often delegated to individual purchasing managers (Wilson et al. 1991), who in turn solicit opinions and vendor assessments from end users of the service. For example, organizations handle their repeat purchase decisions for computer systems support services, telecommunications products and services, and other industrial purchases in this way.

Study Two examines how the decision maker’s (DM’s) overall assessment of a service provider is influenced by the satisfaction of a technical end user (TEU). There are two reasons for this research approach. First, demonstrating multiperson effects for a simplified group decision process is a conservative test of whether or not such effects are likely to influence organizational purchase decisions. Second, by studying decisions involving the ongoing provision of service, we can determine if group effects exist for overall (cumulative) judgments, or simply for a one-time updating of satisfaction as in the first study. Hence, in Study Two the focal dependent variable is the DM’s overall assessment of a service supplier (cf., Bolton and Lemon 1999, Oliver 1997, Parasuraman et al. 1988). Specifically, we study overall satisfaction with service value, which reflects a global judgment or enduring attitude that is more closely linked to actual choice or behavioral intent than transaction-specific satisfaction (Bolton and Drew 1991, Bolton and Lemon 1999, Zeithaml 1988).⁶ Cumulative satisfaction from a value perspective is appropriate, because the DM evaluates the service provider in the context of competitive offerings at various prices.

⁶ We use the term *cumulative* or *overall satisfaction* to denote time-accumulated satisfaction related to enduring attitudes, distinct from transaction-specific satisfaction (Oliver 1997). *Value* pertains to a combined assessment of the perceived cost or sacrifice in obtaining benefits (Bolton and Drew 1991, Zeithaml 1988).

6.2. Model of Decision Maker's Satisfaction Incorporating Satisfaction Escalation

Following Bolton and Drew (1991), we model the DM's overall satisfaction with service value as a function of the DM's satisfaction with the system support service, expectancy disconfirmation, and relationship covariates. Based on conceptualization of social influence effects, we also predict that the DM's overall satisfaction with service value will depend on the TEU's satisfaction with system support satisfaction—and that it may interact with the DM's satisfaction judgments when satisfaction escalation occurs. Algebraically, our model of the DM's service value judgment (VAL_{DM}) is

$$VAL_{DM} = \beta_0 + \beta_1 SAT_{DM}^0 + \beta_2 EXPDIS_{DM} + \beta_3 SAT_{TEU}^0 + \beta_4 SAT_{DM}^0 (SAT_{TEU}^0) + \beta_5 EXPDIS_{DM} (SAT_{TEU}^0) + \sum_k \beta_k (\text{covariates}) + \varepsilon_i, \quad (6)$$

where SAT_i^0 is the DM's or TEU's system support satisfaction, and $EXPDIS_{DM}$ is the DM's expectancy disconfirmation for the service. This parsimonious representation of the DM's value judgment focuses on the prospect of the end-user's influence, and not on the formulation of various antecedents to the DM's or TEU's system support satisfaction, which is beyond the scope of the current study. We amplify upon the interaction effects in the following paragraphs, whereas the situational covariates are discussed when the database is described.

Hypothesis Regarding the Existence of Satisfaction Escalation. The results from Study One suggest that satisfaction escalation is due to an individual perceiving others' judgments to be more extreme than they (objectively) are, due to a confirmatory bias based on his expectations. For a service category in which the DM has considerable experience, the DM's expectations are likely to be reflected in his system support satisfaction level (Anderson and Sullivan 1993, Johnson et al. 1995, Oliver and Winer 1987). Under escalation, the TEU's system support satisfaction will have a greater effect on the DM's service value judgment when it is consistent with these expectations.

HYPOTHESIS 4 (H4). *The greater the DM's system support satisfaction, the greater the increase in the DM's service value judgment due to more positive TEU system satisfaction support (interaction effect, $SAT_{DM}^0 \times SAT_{TEU}^0$).*

Note that Equation (6) is a reduced-form model that does not directly include DEGS or other group factors. Instead, we represent satisfaction escalation by a single interaction term. However, Equation (6) does include performance-based expectancy disconfirmation ($EXPDIS_{DM}$), which is drawn from the traditional

customer satisfaction literature (a completely different construct from DEGS). Consequently, we make no prediction regarding the sign of the TEU's satisfaction interaction with the DM's expectancy disconfirmation.

6.3. Sample and Database

The database consists of a probability sample from the customer list of a supplier that provides system support services to large businesses in North America. Data were collected through a survey of two individuals in each business: the DM who purchases customer support contracts, and a TEU who regularly interacts with customer support services. The identity of the DM and TEU for each business customer was established from the supplier's internal records (based on information provided by account management teams), and verified as part of the interview. When there were multiple TEUs, one TEU was randomly selected from within each customer's organization to represent the opinions of the average TEU.⁷

Qualitative research confirmed that the account teams had correctly identified the DMs and TEUs for a sample of customer organizations. This research also indicated that the DMs and TEUs were knowledgeable about the organizational buying decision and interacted with each other.⁸ In our telephone survey, the questionnaire was rigorously designed to ensure that the interviewer contacted the DM and TEU. The DM was qualified through three screening questions: (1) "Would you consider yourself to be the person who manages personnel who work with supplier X's technical personnel?" (2) "Do you have input into the budget-setting process for system support contracts? Do you make decisions on the purchase and renewal of system support contracts?" (3) "Please stop me at the category that best describes the amount your business paid for system support this year, including payments made to all system support providers." To qualify as a DM, the respondent must answer that she manages technical personnel, has input into the budget-setting process or makes decisions, and be able to state the amount of her company's system support budget.

The identity of the TEU was established through the following two questions: (1) "Would you consider yourself to be the person who is responsible for working with supplier X's technical personnel on a routine basis, or who manages personnel who work with the supplier's technical personnel, or both?" (2) "Do you make recommendations on the purchase and

⁷ We are implicitly assuming that, if this measure has a stochastic error term, it is independently distributed.

⁸ Face-to-face in-depth interviews were conducted with 88 respondents who constituted a mix of DMs and TEUs.

renewal of system support contracts?" To qualify as a TEU, the respondent must indicate that he works with supplier personnel (but does not manage personnel) and makes purchase recommendations. TEU and DM interaction is thus verified by the DM managing technical personnel and the TEU making recommendations about system support services.

The DM and TEU responses were obtained in separate 10- to 15-minute telephone interviews. The joint response rate was 42%, yielding 94 dyads where both members completed interviews. The high response rate is due to the high-quality customer contact list, the high-involvement nature of the survey topic, and the method of survey administration (e.g., 10 callbacks over a two-week period). Accounting for some item nonresponse, we have complete data for 80 dyads (85%) on all variables for both the DM and TEU. Based on an analysis of the cooperating suppliers' records, we concluded that there were no significant differences between the characteristics of the respondents and the target population. In other words, they had similar satisfaction levels, dollars spent of system support contracts, number and type of contracts, and so on.

6.4. Measures

Service Value Judgment. The dependent variable is the DM's judgment of the service value contractually provided by the supplier's system support services. Previous research has conceptualized value as a combined assessment of the perceived sacrifice in obtaining the service (e.g., price) and the benefits received (e.g., Bolton and Drew 1991, Zeithaml 1988). This assessment is made within the competitive context of suppliers who may offer different combinations of price and benefits, with the purchase decision maximizing value, all else equal, similar to utility maximization (e.g., Bolton and Lemon 1999). We measure the DM's overall service value judgment as the average of two items (correlation is 0.85, $p < 0.001$): satisfaction with the value received from supplier's system support (1) considering the amount paid for system support for the supplier, and (2) compared with other companies that provide system support. Response scale is one ("not at all satisfied") to five ("extremely satisfied").

System Support Satisfaction and Expectancy Disconfirmation. The supplier's system support services pertain to both hardware and software. The DM's system support satisfaction is thus measured as the average rating of two items measuring satisfaction with hardware support and software support purchased from the supplier (five-point scale, item correlation = 0.55, $p < 0.001$). This formative index reflects her perceptions of the overall service experience with the supplier in terms of benefits received

(system support). For the TEU's satisfaction, a single item is used measuring overall satisfaction with the supplier's system support. The DM's subjective expectancy disconfirmation is measured with a single item, rating the supplier's system support relative to expectations ("much worse," "somewhat worse," "about the same," "somewhat better," or "much better" than expected). The measures and use of single items are consistent with other field studies of satisfaction (e.g., Bolton and Drew 1991, Bolton and Lemon 1999, Mittal et al. 1999).

Covariates. Previous research suggests various factors relevant to service value assessments, including customer perceptions of *sacrifice* (monetary cost—that is, price—and nonmonetary costs) and situational factors (e.g., Bolton and Drew 1991, Zeithaml 1988). Hence, we incorporated multiple covariates. First, price was represented by the average price per contract and the total dollars spent on system support from the service supplier. Second, situational factors included the DM's length of experience with the supplier and as a purchasing manager, and the DM's evaluation of the relationship with the supplier (five-point satisfaction scale). For brevity, we include only those covariates with significant coefficients in the model.

6.5. Service Value Model Results

Respondents, on average, are satisfied with the service provider (see Table A.4 in the appendix for descriptive statistics and correlations of the variables). The DM's average service value judgment is 3.24, near the scale midpoint. System support satisfaction ratings average 3.80 for the DM and 3.90 for the TEU, which are not significantly different (T -value = 1.05). The DM gives an expectancy disconfirmation average rating of 3.15, which is not significantly different from the "about the same as expected" rating (T -value = 1.47). Overall, DMs exhibit satisfaction ratings that are very similar to those of TEUs, with little expectancy disconfirmation, on average. Under these circumstances, we might expect a single TEU to have little effect on the DM's service value judgment, which proved to not be the case.

We estimated the DM's value judgment with ordinary least squares regression of Equation (6), utilizing mean-centered variables (the condition number is 2.71, and the maximum VIF is 1.74, indicating a lack of significant multicollinearity). The results are shown in Table 3. We see a high model fit, where the DM's service relationship evaluation is the only significant covariate. Coefficients for the DM's system support satisfaction and expectancy disconfirmation are positive and significant, consistent with prior research. Omitting the three TEU satisfaction variables leads to a significantly inferior fit ($F(3, 73) = 3.89$, $p = 0.012$).

Table 3 Results of DM's Service Value Judgment Analysis
 (N = 80 dyads)

Independent variable	Expected sign	Estimated coefficient	Standard error	p-value
DM's system support satisfaction	+	0.241	0.119	0.047
DM's expectancy disconfirmation	+	0.614	0.096	<0.001
TEU's system support satisfaction	+	0.109	0.096	0.258
TEU and DM's satisfaction interaction (H4)	+	0.366	0.140	0.011
TEU's satisfaction and DM's expectancy disconfirmation interaction		-0.375	0.120	0.003
DM's relationship evaluation covariate	+	0.214	0.097	0.030

Note. Dependent variable: DM's service value judgment. $R^2 = 0.64$.

The direct effect of TEU system support satisfaction is not statistically significant, which is consistent with the weak effect found in Study One. Instead, the effect of the TEU's system support satisfaction occurs in the form of interactions with the DM's evaluations. There is a positive interaction of the DM and TEU's satisfaction variables (H4 is supported). The impact of high TEU satisfaction on the DM's value judgment is inflated if the DM is also highly satisfied, consistent with satisfaction escalation (as shown in Study One).

Post Hoc Analysis. We had no prior hypothesis for the interaction of the TEU's satisfaction and the DM's expectancy disconfirmation. Figure 3 illustrates this negative interaction by plotting the DM's value judgment against the TEU's system satisfaction according to the estimated effects (values are standardized; $\pm s$ signifies plus or minus one standard deviation from the mean; all variables not in the figure are fixed at their average values). High (low) levels of the DM's

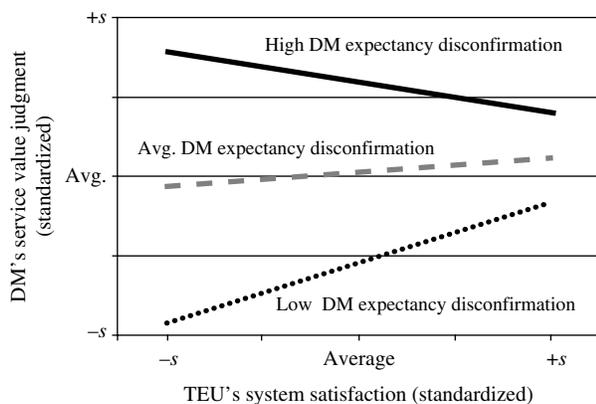
expectancy disconfirmation correspond to one standard deviation above (below) its mean. The results indicate that a lower TEU satisfaction has a more negative impact on the DM's value judgment under lower expectancy disconfirmation. Consider people's well-known aversion to losses (e.g., Kahneman and Tversky 1979), where the relative salience of losses is higher than that of gains. For ongoing evaluations of the service supplier, expectancy disconfirmation is likely to reflect the DM's current reference frame (Anderson and Sullivan 1993, Bolton and Lemon 1999). Low (high) expectancy disconfirmation reflects that the system support overall is worse (better) than expected, corresponding to a loss (gain) frame. Under loss aversion, negative information (low TEU satisfaction) under a loss frame will receive greater weight than positive information (high TEU satisfaction) under a gain frame, leading to the negative interaction we observe. The negative interaction does not contradict the satisfaction escalation of H4—it represents a separate effect in which the TEU's judgment is interpreted or integrated into the DM's judgment according to the reference frame and prior expectations.

In summary, Study Two shows that social influence effects exist in organizational purchase situations—even in simple dyads where the two people have very similar satisfaction levels. Specifically, we find that the DM's judgment is significantly influenced by the TEU's satisfaction level through its interactions with the DM's system support satisfaction and expectancy disconfirmation. Similar to the first study, Study Two demonstrates the existence of satisfaction escalation in groups.

7. Summary, Implications, and Future Research

Satisfaction Escalation. What are the determining factors that explain how satisfaction is modified in the buying group? Our empirical studies reveal several social influence effects consistent with our hypotheses. Study One shows that individuals change their satisfaction judgments based on the satisfaction judgments of other group members, and the perceived DEGS. Our research is the first to reveal DEGS as an important determinant of an individual group member's postdiscussion satisfaction. The results show that highly satisfied individuals tend to expect other group members to be highly satisfied, while also having a highly positive perceived DEGS. Detailed analysis indicates that the DEGS perceptions appear to escalate when perceived group cohesiveness is high. Group members with high susceptibility to social influence emphasize DEGS perceptions and discount others' actual prediscussion satisfaction

Figure 3 Effects of Expectancy Disconfirmation and TEU System Satisfaction



levels when updating their satisfaction judgments. These effects lead to a type of satisfaction escalation, whereby highly satisfied individuals perceive others in the group to be even more satisfied than expected (and more satisfied than they are in reality), resulting in even more positive postdiscussion satisfaction. Our results shed light on the dynamics of satisfaction in group decisions, an area that has been underresearched.

Satisfaction Formation in Intraorganizational Relationships. Study Two confirms the existence of social influences on satisfaction in organizational buying contexts. Purchasing managers' opinions of a service supplier significantly depend on the satisfaction levels of relevant end users. Specifically, the greater the purchasing manager's system support satisfaction, the greater his service value judgment increases with more positive end-user satisfaction, consistent with satisfaction escalation. These results complement Study One by demonstrating that group factors influence cumulative judgments, as well as one-time satisfaction changes. To our knowledge, our research is the first to explicitly link group factors to individual satisfaction judgments.

Key Informant Methods and Interorganizational Relationships. Our findings of social influences on satisfaction may change how marketing scientists conceptualize and measure satisfaction, particularly for interorganizational relationships or situations involving key informants or proxy reports. Group interaction can improve the accuracy of proxy reports (Menon et al. 1995), but our results raise important caveats given potential escalation and the biases associated with the perceived satisfaction of others. A simple averaging of judgments clearly misrepresents the social processes, yet improved competency- or confidence-based methods for key informant data (e.g., Kumar et al. 1993, Van Bruggen et al. 2002) may not adequately address the identified biases. Researchers have expressed particular concern about common method bias in studies that rely solely on survey data to investigate the link between marketing constructs and financial outcomes. Increasingly, best practice requires key informants' reports of business performance to be validated by a second data source for (at least) a subsample of the data (e.g., Vorhies and Morgan 2005). Our study adds to these concerns by suggesting that key informant reports of enterprise-level satisfaction are also biased. Specifically, our finding of satisfaction escalation implies that key informant reports of satisfaction will be biased toward the extremes (consistent with the skewed distribution of most satisfaction data). Hence, we believe that researchers studying interorganizational relationships, as well as group outcomes, should follow best

practice and validate information from key informants with measures from other group members, or other external sources, whenever possible.

7.1. Managerial Implications

Managing Satisfaction Escalation. Given the large number of purchase decisions made by groups, firms could benefit from a better understanding of how satisfaction develops in group decision settings. Satisfaction escalation effects due to DEGS, for example, may not improve the group's decision. Although the effects are associated with greater cohesiveness, group members could be conforming to an inferior position as judgments escalate or polarize due to DEGS. Focusing the group on performance evaluations (information) instead of overall judgments (norms) could reduce this effect (e.g., Kaplan and Miller 1987), but it can be difficult to separate information exchange from subsequent inferences regarding overall satisfaction judgments. One possibility is for the group to make its repeat purchase decision with little or no discussion through which biases can be spread, and to distribute anonymously information to others. This procedure may be problematic, however, because group members could find it difficult to determine the validity of each piece of information if they don't know the source, and therefore give more weight to their own prediscussion anchors. The confidence effect could then bias group members toward their prior positions, possibly leading to nonoptimal decisions. Encouraging group members to objectively justify their evaluations, readily share conflicting information, or otherwise be willing to modify their prediscussion tendencies could facilitate better group judgment (e.g., Edwards and Smith 1996). More generally, if DEGS perceptions are related to various biases, then the management of DEGS could lead to better decisions in terms of accuracy or conformity with desired norms and trade-offs. Managing expectations might be an appropriate managerial approach in group decision making, much as it is in managing consumer satisfaction. A satisfaction escalation bias dictates a detailed process perspective of managed expectations to positively affect purchase behavior (see Boulding et al. 1993).

Ripple Effects on Expectations and Beliefs. The potential for satisfaction biases prompts us to consider how anticipating group discussion content influences expectations and beliefs. Schlosser and Shavitt (2002) find that anticipating the group's discussion may alter judgments and responses shared in the group, which may in turn contribute to biased satisfaction judgments because of a narrowing of the factors that are considered in developing such projections. Such biases could affect not only the individual's satisfaction judgments, but also the group's

judgments, through continued discussions that reinforce prior perceptions through repetition and confirmatory biases (Brauer et al. 1995, Russo et al. 1996). For example, the normative desire for acceptance from other group members may lead some individuals to censor their participation and escalate their positive judgments, creating what amounts to a bandwagon effect. A bias against disconfirming evidence can be strong enough to lead individuals to confidently believe in a wrong opinion (Rabin and Schrag 1999), perhaps similar to our observation that some individuals perceived positive DEGS when the discrepancy was objectively negative. Edwards and Smith (1996) found a disconfirmation bias that is stronger under greater emotional conviction, which seems analogous to our cohesiveness finding. Overall, the negative interaction between influence susceptibility and others' satisfaction may relate to the discussion being inconsistent with prediscussion judgments (either as perceived or in reality), and not solely the result of inflating the DEGS perceptions. Further disentanglement of these effects is clearly needed.

7.2. Limitations and Future Research

Experiments to Study Underlying Theoretical Mechanisms. Our first empirical study is based on student groups that largely agree in their positive evaluations of the product. Greater conflict in opinion could lead to more varied satisfaction updating. The group decision in our first study is also related to a product recommendation where the product's performance is somewhat dependent on group interplay. This feature could accentuate the group cohesiveness effect, relative to other situations where product performance is less directly tied to group cooperation. Although we find that individuals highly susceptible to social influence discount the actual satisfaction judgments of others when updating their satisfaction, further study is needed to determine whether this effect generalizes across various group decision contexts. The study incorporates changes in product performance and expectancy disconfirmation, but changes in expectations themselves may also contribute to satisfaction formation over repeated product experiences. Future studies could examine satisfaction updating over repeated group interactions to extend our results for a one-time updating.

Field Research Linking Satisfaction and Purchase Decisions Over Time. Our second study raises new questions about the cumulative satisfaction judgments of purchasing managers. Various group decision effects may additionally moderate the relationship between satisfaction and the purchase decision, a point that merits further investigation (see Grewal et al. 2004 for an example of interpersonal influences on the repeat purchase of consumer

durables). Our results may apply more generally to a variety of group-oriented purchase decisions where satisfaction is relevant, such as family purchases or consumer decisions that have a social context.⁹ Future research should seek to replicate our results in more detailed longitudinal analyses for a variety of organizational and consumer purchase decisions.

Discussion Biases. The significant effect of a perceived discrepancy with expected group satisfaction and its escalation present complicated biasing influences in group discussion dynamics. Not only might group members' discrepancy perceptions be influenced by their own expectations (a type of confirmatory bias), but these effects could also moderate how the group discussion unfolds. If initial discussion reveals largely confirmatory information, for example, group members may see little incentive in sharing any further information regardless of its usefulness. This self-censoring could be compounded if the discrepancy perceptions themselves are subject to biases. Exploring these potential biases further requires a more dynamic modeling of the group decision process than what has been presented here, as well as content analysis and detailed process measures of group discussion. Our analyses found no significant endogeneity in estimating postdiscussion satisfaction, but understanding the full process of escalated discrepancy perceptions and links to group cohesiveness would be fruitful future research.

In general, we believe that social influence effects, and the discrepancy with expected group satisfaction in particular, add important new dimensions to satisfaction research. Our analyses demonstrate the importance of social influence and group decision variables on satisfaction updating. Our group satisfaction framework thereby moves beyond past satisfaction research and the typical satisfaction antecedents. We expect this new perspective to promote future research on satisfaction in group decision settings, and foster new insights into managing satisfaction for organizational and family purchases.

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⁹ At a more aggregate level of analysis, stronger social influence and cohesiveness may increase the contagion effect in product diffusion (Van den Bulte and Stremersch 2004). Social influences also affect the dynamics of word-of-mouth communications (see Godes and Mayzlin 2004 for a recent study).

Appendix

Table A.1 Summary of Measures for Study One

Variable	Example items
<i>Prediscussion:</i>	
Susceptibility to social influence (SSI; 8 items)*	"I often identify with other people by purchasing the same products and brands they purchase." "I like to know what brands and products make good impressions on others."
Product attribute performance	See Table A.2
Expectancy disconfirmation (2 items)	"My overall experience with the team in preparing the simulation assignment exceeded my expectations." "The value of what I learned from the simulation assignment exceeded my expectations."
Satisfaction judgment (2 items)	"Overall, I am satisfied with my team's experience in preparing for the simulation assignment." "Overall, I am satisfied with the lessons learned from the simulation assignment."
Confidence in satisfaction	"I am confident in my response" for both satisfaction items.
Cohesiveness (5 items)	"Do you feel that you are really a part of your group?" "How does your group compare to other work groups of which you are a member in the way people help one another out?"
Expected satisfaction of others (2 items)	"Overall, I expect my other team members are satisfied with our team experience in preparing the simulation assignment." "Overall, I expect my other team members are satisfied with the lessons he/she learned from the simulation assignment."
<i>Postdiscussion:</i>	
Product attribute performance	Same items as prediscussion.
Expectancy disconfirmation	Same items as prediscussion.
Satisfaction judgment	Same items as prediscussion.
Discrepancy with expected group (DEGS; 2 items)	"Overall, I found that, compared to what I expected, the satisfaction of my other team members with our team experience in preparing the simulation assignment was..." "Overall, I found that, compared to what I expected, the satisfaction of my other team members with the lessons learned from the simulation assignment was..."

*SSI was measured several weeks prior to group discussion.

Table A.2 Attribute Performance Evaluation Scales and Reliabilities for Study One

	Factor loadings		
	Factor 1	Factor 2	Factor 3
GROUP—value of the group experience			
1. I enjoyed working on the simulation with my team members.	0.82	0.12	0.10
2. Our group communicated well in making major decisions for the simulation assignment.	0.82	0.20	–0.07
3. The simulation assignment provided a good opportunity for me to learn from my other team members.	0.78	0.26	0.10
4. Compared to other group assignments I've had, the simulation assignment was one of the best.	0.57	0.43	0.11
Reliability = 0.81 for prediscussion evaluations, 0.84 postdiscussion.			
LEARN—lessons learned about marketing management			
1. The simulation assignment placed me in the role of a key decision maker.	0.09	0.75	–0.12
2. The simulation assignment improved my understanding of marketing principles and concepts.	0.20	0.75	0.29
3. The simulation assignment taught me valuable lessons about marketing tactics and techniques.	0.40	0.71	0.24
4. I was able to apply tools and knowledge I learned in other business subjects to the simulation assignment.	0.15	0.68	0.14
5. I gained new insights about business strategy from the simulation assignment.	0.43	0.65	0.24
6. The simulation assignment was a realistic portrayal of a marketing situation.	0.24	0.52	0.26
Reliability = 0.84 for prediscussion evaluations, 0.94 postdiscussion.			
EFFORT—assignment effort			
1. The time and energy demands of the simulation assignment were higher than the demands in other courses.	0.04	0.16	0.91
2. The simulation assignment required more effort than assignments I've prepared for other business courses.	0.04	0.17	0.88
EFFORT item correlation = 0.71 prediscussion, 0.86 postdiscussion ($p < 0.001$).			

Note. Evaluations rated on a 10-point agree/disagree scale for items shown (0 = "strongly disagree," 9 = "strongly agree"). All evaluations are rated by individuals both pre- and postdiscussion. Factor analysis statistics shown for prediscussion evaluations, varimax rotation.

Table A.3 Descriptive Statistics and Correlations of Variables for Study One

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17
X1. Postdiscussion satisfaction	—																
X2. Prediscussion satisfaction	0.86	—															
X3. Change in group evaluation	0.14	-0.14	—														
X4. Change in learn evaluation	0.38	0.21	0.26	—													
X5. Change in effort evaluation	0.01	-0.02	0.01	0.26	—												
X6. Change in expectancy disconfirmation	-0.01	-0.26	0.31	0.39	0.20	—											
X7. Others' satisfaction	0.47	0.40	0.08	0.22	-0.03	0.02	—										
X8. Confidence	0.22	0.28	-0.08	0.06	-0.04	-0.02	0.22	—									
X9. SSI	0.02	-0.02	0.06	-0.09	-0.03	-0.02	0.12	-0.13	—								
X10. DEGS	0.65	0.59	0.16	0.33	0.10	0.04	0.49	0.27	-0.02	—							
X11. Expected satisfaction of others	0.68	0.69	0.03	0.16	0.02	-0.10	0.39	0.29	0.00	0.75	—						
X12. Cohesiveness	0.36	0.32	0.06	0.09	0.08	0.10	0.20	0.07	0.01	0.34	0.43	—					
X13. (Prediscussion satisfaction) × (confidence)	0.11	0.05	0.09	0.05	-0.06	-0.08	-0.14	-0.29	-0.14	-0.05	-0.08	-0.14	—				
X14. (Others' satisfaction) × (SSI)	-0.01	0.02	-0.07	-0.01	-0.05	0.08	-0.00	-0.03	-0.02	-0.03	0.01	-0.02	-0.02	—			
X15. (DEGS) × (SSI)	-0.08	-0.14	-0.11	0.01	0.07	0.13	-0.03	-0.16	0.02	-0.16	-0.19	-0.00	0.04	0.52	—		
X16. (Expected satisfaction) × (others' satisfaction)	-0.30	-0.33	-0.08	-0.03	-0.01	0.03	-0.23	-0.07	0.01	-0.34	-0.34	-0.09	0.23	0.15	0.34	—	
X17. (Expected satisfaction) × (cohesiveness)	-0.16	-0.24	0.06	0.03	0.04	0.22	-0.10	-0.07	-0.06	-0.08	-0.24	0.06	0.28	0.02	0.18	0.46	—
Mean	6.85	6.75	0.16	-0.04	-0.17	0.14	6.75	8.11	3.82	2.15	6.91	0.00	0.43	0.28	-0.05	0.71	0.43
Standard deviation	1.52	1.71	0.84	0.83	1.27	1.25	1.26	0.92	1.81	1.59	1.49	0.67	1.58	2.19	3.16	1.91	1.07

Notes. $N = 152$. Off-diagonal elements are Pearson correlation coefficients. Correlations > 0.16 significant at $p < 0.05$; $r > 0.21$ significant at $p < 0.01$. Data for interaction variables (X13–X17) reflect mean-centering of each of the two variables in the interaction.

Table A.4 Descriptive Statistics and Correlations of Variables for Study Two

	X1	X2	X3	X4	X5	X6	X7
X1. Service value judgment, DM	—						
X2. System support satisfaction, DM	0.58	—					
X3. System support satisfaction, TEU	0.43	0.43	—				
X4. Expectancy disconfirmation, DM	0.71	0.56	0.43	—			
X5. Interaction, DM and TEU system satisfaction	-0.03	-0.20	-0.02	-0.05	—		
X6. Interaction, DM's expectancy disconfirmation and TEU's satisfaction	-0.10	-0.05	0.08	0.11	0.62	—	
X7. DM's relationship evaluation	0.41	0.39	0.25	0.26	-0.16	-0.11	—
Mean	3.24	3.80	3.90	3.15	0.27	0.33	3.75
Standard deviation	0.99	0.77	0.84	0.92	0.64	0.75	0.79

Notes. $N = 80$. Off-diagonal elements are Pearson correlation coefficients. Correlations > 0.22 significant at $p < 0.05$; $r > 0.36$ significant at $p < 0.01$. Data for interaction variables (X5 and X6) reflect mean-centering of each of the two variables in the interaction.

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