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In this article, the authors contend that member influence in a group's decision could be decomposed into two distinct elements of preference revision and concession. Using a hierarchical Bayes model of dyadic decision making, the authors show that the degree of preference revision and concession varies across product attributes, individuals, and product categories. The authors demonstrate that converging preferences affect a member's concession, which in turn affects members' satisfaction with the joint decision. More important, a member's satisfaction is higher when his or her concession is reciprocated.

Understanding the Role of Preference Revision and Concession in Group Decisions

Several articles in marketing have studied the role of member influence in a group's decision. For example, member influence in family decisions is related to factors such as preference intensity, decision history, expertise (Corfman and Lehmann 1987), product category (De Bourdeaudhuij and Van-Oost 1998; Foxman, Tansuhaj, and Ekstrom 1989), product importance (Cuccaro 1996), and purchase decision stage (Beatty and Talpade 1994). Traditionally, influence is measured as stated by a respondent or is inferred from the joint decision outcome. A common approach (Arora and Allenby 1999; Corfman 1991; Krishnamurthi 1989) to infer a member's influence is first to measure his or her initial preference and then compare it with the group's preference as reflected by the decision outcome. If the group's preference is similar (dissimilar) to the member's initial preference, the member is expected to have exerted a high (low) influence on the decision outcome. Measurement problems such as perceptual and reporting biases associated with the stated measure are well documented, and the inferred measure is therefore preferred (Corfman 1991; Dellaert, Prodigalidad, and Louviere 1998; Madrigal and Miller 1996).

Although influence as the focal construct is well researched in marketing, it is limited in its ability to provide insights into the underlying group decision-making process. Specifically, because of the discussions preceding a group's decision, a member may *revise* his or her preference (Menasco and Curry 1989). Furthermore, he or she may *concede* to another member's preference (Davis 1973) when the decision is actually made. To better understand the process underlying a group's decision, in this article we decompose influence into the two components of revision and concession. We investigate how attribute-specific preference revision and concession vary across consumers in the marketplace and how a member's preference revision and concession vary by attributes of a product. We show that converging preferences of members reduce concession, which in turn enhances members' satisfaction with the group decision.

From the standpoint of marketing, the article demonstrates the importance of studying revision and concession for both buyers and sellers. Because it is important for a buyer to be satisfied with a joint decision (e.g., a furniture or appliance purchase), this article suggests that active effort to revise own preferences in the direction of others' is likely to reduce the need to concede. This, in turn, should positively affect own satisfaction with the decision. In the presence of differing preferences, a member's effort to reciprocate concession made by others is also likely to affect others' satisfaction in a positive way. Revising preferences in the direction of other members' and reciprocating concession therefore could be viewed as means to maximize a buyer's satisfaction in a joint decision.

For sellers, it is important that each (and not just the most influential) member is satisfied with the joint purchase made

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by a group, because postpurchase satisfaction has a direct impact on merchandise return, repeat business (Biehal 1983), and positive word of mouth (Singh 1988). In situations involving salesperson contact, an effort to encourage preference revision and concession reciprocity among members is likely to enhance each member's satisfaction with the decision outcome. This, in turn, should reduce merchandise return and increase repeat business and positive word-of-mouth advertising.

We develop a hierarchical Bayes model (Allenby and Lenk 1994) of group decision making that incorporates preference revision and concession at the attribute level during the decision process. The model is conceptualized at the individual level, so attribute preference revision and concession estimates are available for each member of a dyad. The overall measure of a member's influence is shown to be a function of each member's attribute preference revision and concession. We tested the model using two field studies and found substantial differences in the degree of revision and concession across attributes, individuals, dyads, and product categories. We found preference revision and concession to be strongly associated with demographic variables such as sex, age, and education.

Our results show that converging preferences lead to reduced concession by each member, and concession, in turn, systematically affects postdecision satisfaction. Specifically, we show that higher concession by a member results in a lower postpurchase satisfaction with the decision outcome. We also demonstrate that this effect is moderated by concession made by others. That is, concession made by a member of a dyad is likely to result in higher postdecision satisfaction when it is reciprocated by the other member (Deutsch 1975; Messick and Cook 1983) than when it is not.

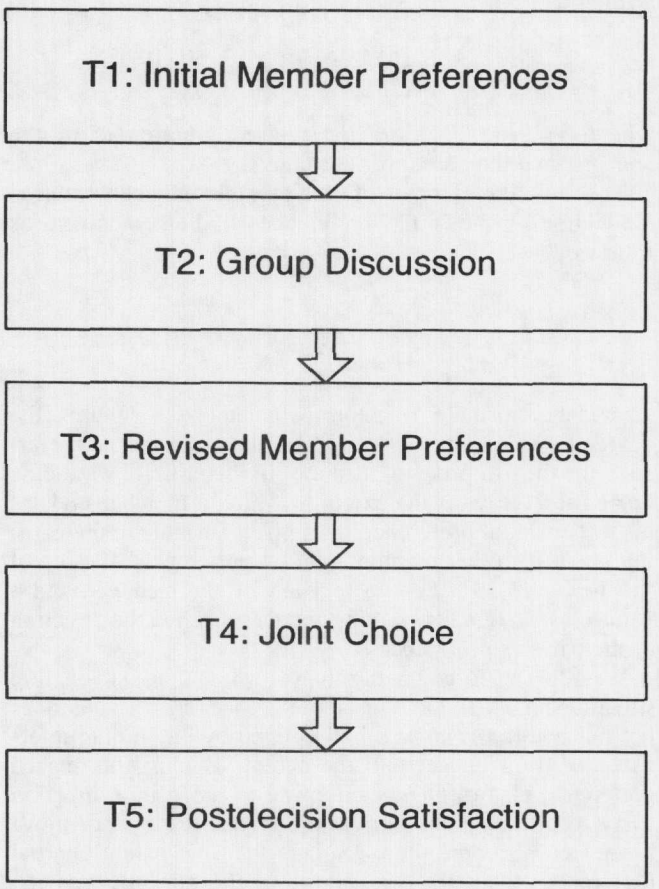
The article is organized as follows: In the next section, we propose a hierarchical Bayes model that captures revision and concession at the attribute level. We then establish the theoretical link that relates postdecision satisfaction to revision and concession. This is followed by the empirical section, which involves two separate product categories. We conclude with a discussion of our findings.

MODEL AND THEORY

We begin with a simplifying framework that captures different stages of a group's decision-making process. In this framework, we divide the group decision process into sequential stages (prediscussion, group discussion, postdiscussion, joint choice, and postdecision) as displayed in Figure 1. Sengupta and Te'eni (1993) and Chandrashekaran and colleagues (1996) also use a similar simplifying framework to capture the different stages.

Although not all group decisions exactly follow the five stages shown in Figure 1, this framework simplifies the exposition of revision and concession processes that are the focus of this article. In Stage 1 (prediscussion), individual group members are assumed to possess initial preferences for the attributes of the target product. Group members are expected to engage in information exchange in Stage 2 (group discussion), in which they may make an effort to articulate their own preferences and attempt to learn about the others' preferences. Such a discussion may result in a change in each member's preference (Stage 3). However, to reach a joint choice (Stage 4), a member may choose to concede to another member's preference. Finally, both members may reflect on (Stage 5) their satisfaction with the group decision on the basis of preference revision and concession made during the earlier stages of the decision process.

Figure 1
A GENERAL FRAMEWORK FOR GROUP DECISIONS



Econometric Model

Consider a situation in which a parent and a teenager jointly evaluate a given product alternative. Let subscripts j, k, p, t, and d refer to a choice alternative j, attribute k, parent p, teenager t, and dyad d. In Stage 1 (Figure 1), let u^I_{tj} be the initial utility of a teenager for product choice alternative j. The deterministic part of overall utility of this choice alternative for each member of the dyad can then be written as

$$(1) \qquad u^I_{tj} = \sum_k x_{tjk}\beta^I_{tk} \quad \text{and} \quad u^I_{pj} = \sum_k x_{pjk}\beta^I_{pk},$$

where x_{tjk} and x_{pjk} indicate the specification of attribute k in product choice j that the teenager and the parent evaluate. The elements β^I_{tk} and β^I_{pk} capture the initial preference of the teenager and the parent toward attribute k. In this article, we define *preference* as the sensitivity of a member's utility to a change in the attribute (i.e., $\beta_k = \partial u/\partial x_k$).

On the basis of a group discussion that involves an exchange of member likes and dislikes pertaining to the attributes of the target product, it is reasonable to expect that

individual members may revise their preferences. These revised preferences are likely to affect the individual utilities of each member in the dyad. Therefore, during Stage 3 in Figure 1, the revised utilities of a given alternative can be written as

$$(2) \qquad u^R_{tj} = \sum_k x_{tjk}\beta^R_{tk} \text{ and } u^R_{pj} = \sum_k x_{pjk}\beta^R_{pk},$$

where β^R_{tk} and β^R_{pk} are the revised preferences of the teenager and the parent for attribute k.

The revised preference of each member may be written as a function of the initial preferences of both members as follows:

$$(3) \qquad \beta^R_{tk} = \gamma_{tk}\beta^I_{tk} + (1 - \gamma_{tk})\beta^I_{pk} \text{ and}$$

$$\beta^R_{pk} = \gamma_{pk}\beta^I_{pk} + (1 - \gamma_{pk})\beta^I_{tk},$$

where the attribute revision parameter γ_{tk} captures the degree to which a teenager updates his or her initial preference for the kth product attribute. In this article, we define *attribute revision* as the extent to which a member updates his or her initial preference for a given attribute upon learning about the other member's initial preference. A value of γ_{tk} close to 1 indicates no revision by the teenager, and a value close to 0 indicates substantial revision in the direction of the parent's preference.

We allow γ_{tk} to be greater than 1 or less than 0 to capture situations in which the revised preference of a teenager does not fall within the convex hull defined by the initial preferences of the teenager and the parent. That is, the revised preference of a teenager is allowed to move in a direction away from the parent's initial preference ($\gamma_{tk} > 1$) or move toward and become more extreme than the parent's initial preference ($\gamma_{tk} < 0$). Similar to γ_{tk}, the attribute revision parameter γ_{pk} captures the extent to which a parent revises his or her preference. Note that in the specification in Equation 3, the revision parameter is unique for the parent and the teenager to accommodate different possible combinations of revision patterns (e.g., both revise in each other's direction, only one revises but away from the other's direction). The specification of the revision parameter is therefore flexible. Also, the extent of attribute preference difference between members, upon revision, can be easily obtained by evaluating $|\beta^R_{pk} - \beta^R_{tk}|$ (Equation 2). As discussed subsequently, such a measure of attribute preference difference is useful in investigating the relationship between preference convergence and concession.

In Stage 4 (Figure 1), in which a joint decision is made, the dyad utility can be written as follows:

$$(4) \qquad u_{dj} = \sum_i x_{djk}\beta_{dk} + \varepsilon_{dj},$$

where $\beta_{dk} = \phi_{pk}\beta^R_{pk} + (1 - \phi_{pk})\beta^R_{tk}$; β_{dk} is the dyad's preference toward attribute k; and ϕ_{pk}, the attribute concession parameter, captures the degree to which the parent concedes to the teenager's preference for attribute k in the dyadic choice decision. In this article, we define *attribute concession* as the extent to which a member compromises or gives in his or her own attribute preference at the joint decision stage. A value of ϕ_{pk} close to 1 indicates no concession by the parent to the teenager's preference, and a value close to 0 indicates complete concession. Unlike the revision parameters γ_{tk} and γ_{pk}, which are independent, the ϕ_{pk} measure is relative. That is, a parent's attribute concession in Equation 4 is given by ϕ_{pk}, and a teenager's concession is given by $(1 - \phi_{pk})$.

Assuming independently and identically distributed extreme value error in Equation 4, the choice probabilities for the alternative j can then be written as

$$(5) \qquad Pr_{dj} = \frac{\exp(u_{dj})}{\sum_m \exp(u_{dm})}.$$

Traditionally, *influence* is defined as the degree to which a group member is able to maximize own preference compared with others' in a joint decision (e.g., Corfman 1991). As stated previously, from a theoretical standpoint, a key contribution of this research is that we decompose the traditional measure of attribute influence into revision and concession. Next, we establish a formal link among revision, concession, and influence. For the notation used in Equations 1–5, prior research on outcome-based measures (e.g., Arora and Allenby 1999; Krishnamurthi 1989) defines the influence parameter ω_{pk} as follows:

$$(6) \qquad \beta_{dk} = \omega_{pk}\beta^I_{pk} + (1 - \omega_{pk})\beta^I_{tk},$$

where ω_{pk} captures the influence of the parent for the kth product attribute. A value of ω_{pk} close to 1 indicates high influence, and a value close to 0 indicates low influence. Rewriting Equation 4 by substituting Equation 3,

$$(7) \qquad \begin{aligned} \beta_{dk} &= \phi_{pk}[\gamma_{pk}\beta^I_{pk} + (1 - \gamma_{pk})\beta^I_{tk}] \\ &\quad + (1 - \phi_{pk})[\gamma_{tk}\beta^I_{tk} + (1 - \gamma_{tk})\beta^I_{pk}] \\ &= [(1 - \phi_{pk})(1 - \gamma_{tk}) + \phi_{pk}\gamma_{pk}]\beta^I_{pk} \\ &\quad + [(1 - \phi_{pk})\gamma_{tk} + \phi_{pk}(1 - \gamma_{pk})]\beta^I_{tk}. \end{aligned}$$

From Equations 6 and 7, the influence measure can then be written as

$$(8) \qquad \omega_{pk} = (1 - \phi_{pk})(1 - \gamma_{tk}) + \phi_{pk}\gamma_{pk}.$$

The parent's attribute-specific influence (ω_p) therefore is a function of both attribute revision (γ_p,γ_t) and attribute concession (ϕ_p). By evaluating the first derivative of (ω_p) with respect to γ_p,γ_t and ϕ_p, it can be shown that higher attribute revision by the teenager, lower attribute revision by the parent, or lower attribute concession by the parent implies higher attribute influence by the parent. The expression for influence in Equation 8 therefore appears reasonable.

The model development until this point has focused on a given dyad. However, the preference, attribute revision, and attribute concession parameters across the sample are expected to vary. In this article, heterogeneity across respondents for preferences, attribute revision, and attribute concession is captured by the following random-effects specifications:

$$(9) \qquad \beta^I_p \sim \text{Normal}(\bar{\beta}_p, B_p), \quad \beta^I_t \sim \text{Normal}(\bar{\beta}_t, B_t);$$

$$(10) \qquad \gamma_p \sim \text{Normal}(\bar{\gamma}_p, G_p), \gamma_t \sim \text{Normal}(\bar{\gamma}_t, G_t); \text{ and}$$

$$(11) \qquad \phi_p \sim \text{Normal}(\bar{\phi}_p, F_p).$$

In Equations 9–11, the mean vector of the normal distribution captures the central tendency of the parameters (attribute preference, revision, and concession), and the covariance matrix captures the covariation pattern across the sample. The diagonal elements of the covariance matrix are particularly informative, because they provide variance estimates indicative of the extent of heterogeneity for each parameter. As is typical of hierarchical Bayes models (Allenby, Arora, and Ginter 1995, 1998; Arora, Allenby, and Ginter 1998; Wedel et al. 1999), in addition to characterizing heterogeneity (Equations 9–11), the proposed model also provides individual estimates for attribute preference, revision, and concession. The model is estimated by the Metropolis–Hastings algorithm (Chib and Greenberg 1995), which uses simulated draws from conditional distributions of model parameters to perform the estimation. (Technical details are available from the authors on request.)

Relationship Between Preference Convergence and Concession

Although the existence of preference revision is recognized in marketing (Chandrashekaran et al. 1996; Menasco and Curry 1989; Rao and Steckel 1991), how it relates to preference concession has not been studied. Extant literature in organizational behavior and management information systems suggests that an intervention that facilitates interactive discussion during the decision process improves the effectiveness of group decisions (Hall and Watson 1970; Innami 1994; Sengupta and Te'eni 1993; Van de Ven and Delbecq 1971). Specifically, it is argued that such a discussion provides opportunities for group members to understand the reasons for one another's likes and dislikes. The exposition of members' diverse perspectives is expected to result in convergence of preference (Hall and Watson 1970; Sengupta and Te'eni 1993), which in turn reduces conflict (Hammond, McClelland, and Mumpower 1980).

The relationship between preference revision and conflict also applies to group purchase decisions. Equation 2 shows that as a result of the preference revision process, differences in revised attribute preferences (β_p^R and β_c^R) between members directly affect differences in how members evaluate (u_p^R and u_c^R) the available alternatives. Equation 2 therefore suggests that preference convergence between members results in the convergence of evaluations of alternatives. Conversely, large preference differences result in different evaluations of alternatives.

On the basis of prior research (Menasco and Curry 1989; Pollay 1968), we define concession across attributes as the difference between the member's utility of the jointly chosen alternative and the utility of his or her most liked alternative. Therefore, member i's concession corresponding to the jointly chosen alternative can be written as

$$\text{Concession}_i(\text{chosen}) = u_i(\max) - u_i(\text{chosen}), \quad (12)$$

$$\text{Concession}_i(\text{chosen}) \geq 0,$$

where $u_i(\max)$ is the maximum utility member i could have received by choosing his or her most preferred alternative, and $u_i(\text{chosen})$ is the utility of the jointly chosen alternative. This measure of concession equals 0 when the jointly chosen alternative is the same as the member i's utility-maximizing alternative and greater than 0 otherwise. For ease of exposition, in the remainder of the article we use the term "attribute concession" to refer to giving in that occurs at the attribute level, as defined by ϕ_k in Equation 4, and "concession" to refer to giving in across attributes, as defined in Equation 12.

Equation 12 suggests that revised preference differences between members determine the extent of concession each member has to make. That is, situations in which members' revised preferences are similar (i.e., converge) require little concession by a given member because u(max) and u(chosen) tend to be the same. Large differences in revised preference, in contrast, increase the likelihood that a member must concede, because u(max) and u(chosen) are now less likely to be the same. Collectively, Equations 2 and 12 suggest that higher preference revision by a member in the direction of the other member's preference should result in converging preferences, which should reduce the likelihood that he or she must concede. Preference convergence between members should therefore reduce the concession made by each.

Relationship Between Concession and Satisfaction

A member's postdecision satisfaction depends on the degree of concession made by each member of the group. When two group members prefer different alternatives from the available choice set, at least one member must concede. In an effort to maximize his or her own utility, it is reasonable to expect that a member is likely to minimize his or her concession (Menasco and Curry 1989). Therefore, we expect a member's postdecision satisfaction to be low when his or her concession is high.

Prior research (Corfman and Lehmann 1993; Loewenstein, Thompson, and Bazerman 1989) demonstrates that parties in a negotiating context take each other's payoffs into account in the evaluation of the negotiation settlements. In a cooperative decision-making situation such as our study, consideration for the other party is expected to be high, and as a result, each member of a dyad may want to minimize the other's concession. Therefore, a member's postdecision satisfaction with the chosen alternative is expected to be low when the other member's concession is high.

The effect of a member's concession on postdecision satisfaction should also be moderated by the other member's concession. This interaction effect can be explained by the fairness principle (Albin 1993; Kahneman, Knetsch, and Thaler 1986) and equity theory (Deutsch 1975; Messick and Cook 1983). Three main principles used to determine outcome fairness (Albin 1993) include equity (benefits allocated in proportion to contribution), equality (benefits allocated equally among parties), and need (benefits allocated primarily to those in most need). In a cooperative setup, as in the parent–teen dyad, in which fostering personal relations is important, the equality principle is expected to be dominant (Deutsch 1975). Therefore, concession made by a member is more likely to result in higher postdecision satisfaction when it is reciprocated by the other member than when it is not.

EMPIRICAL TESTING

To test our model, we designed and implemented two field studies involving different product categories, an infrequently purchased, high-priced product (personal computer [PC]) and a frequently purchased, low-priced product (sweet snack). Consistent with the general framework presented in Figure 1, both studies included multiple steps to allow for

Table 1
COMPUTER ATTRIBUTES AND LEVELS

Attributes	*Levels*
Computer brand	IBM
	eMachine
Microprocessor brand	Intel Pentium III
	AMD K6-II
Microprocessor speed	600 MHZ
	433 MHZ
Warranty	2 years
	No warranty
Price	$1,799
	$1,299

the investigation of revision and concession. The primary purpose of Study 1 was to test the proposed model, investigate how attribute revision and concession vary across attributes and dyad members, and explore if attribute revision and concession are related to demographic variables. We designed Study 2 primarily to investigate the relationship between concession and postdecision satisfaction. It also enabled us to study the impact of preference convergence on concession. Because we used a different product category in each study, it was instructive to contrast the degree of attribute revision and concession across Studies 1 and 2.

STUDY 1

The first study involved a purchase decision for a PC by a parent–teen dyad. The five product attributes and levels chosen for the study are reported in Table 1. The following key steps were involved in the study:

Step 1 (an individual task): The goal of Step 1 was to obtain each member's initial preference for the five attributes reported in Table 1. A choice-based conjoint task involving eight triples was used for this purpose. A choice design was created using the OPTEX procedure in SAS (2000). Attribute levels were swapped to remove any dominated alternatives (Arora and Huber 2001). When responding to the choice task, members were instructed to provide strictly their own preferences. Specifically, they were asked, "In this part of the study *your opinion is the only one that counts.* Do not consider your child's (parent's) likes and dislikes when evaluating the following alternatives. We would like you to choose a computer that *you* prefer the most."

Step 2 (a group task): Next, members were asked to discuss their likes and dislikes with regard to the computer features included in the study. The goal in Step 2 was to facilitate information exchange between members.

Step 3 (an individual task): In Step 3, we obtained each member's revised preferences after the group discussion. As in Step 1, members in this step were instructed to provide strictly their own preferences through a choice-based conjoint task. The OPTEX conjoint design used in Step 3 entailed making choices from a set of alternatives different from the one used earlier, to prevent any carryover effects in responses.

Step 4 (a group task): The purpose of Step 4 was to obtain joint choices from eight different choice sets. Members in this step were instructed to select jointly an alternative from each choice set in the conjoint task. Specifically, they were asked, "From the following alternatives, we would like you to choose a computer that you *both* prefer the most."

Step 5 (an individual task): In Step 5, demographic information on factors such as sex, age, education, and income was obtained.

Data Collection

Data were collected with the help of Cunningham Sensory Services Inc. in a large Midwestern U.S. city. Only dyads that were likely to buy a PC within the next year were recruited for the study. A quota sample with the following guidelines was used: Half the teenagers were targeted to be between 15 and 16 years of age and the remaining half between 17 and 18 years of age. For both parents and teenagers, an equal number of male and female respondents were targeted to be included in the sample.

The questionnaire was pretested on ten parent–teen dyads. On the basis of the pretest, several questions and instructions in the survey were simplified and/or rewritten. A total of 135 parent–teen dyads participated in the study. The study was run for four weeks, with several one-hour sessions each day. The subjects spent approximately 30–40 minutes to complete the survey. Participating dyads received $40 for their participation. Of the 135 parent–teen dyads, data collected from 6 dyads were not usable because of missing values. For the reported analyses, the data from the remaining 129 dyads were used.

Sample Profile

The average age of the parents and teenagers was 46 and 16 years, respectively. Fifty-five percent of the parents and 47% of teenagers were female. The modal income of the families participating in the study was more than $70,000. Teenagers participating in the study perceived themselves as more knowledgeable about computers (means for parents = 3.66 and teenagers = 4.19 using a 1–7 scale, where 7 represented "very knowledgeable"; $t(255) = 3.05$, $p < .01$), and the computer was more important to the teenagers (means for parents = 4.57 and teenagers = 5.62 using a 1–9 scale, where 9 represented "more important"; $t(255) = 4.62$, $p < .01$). The teenagers also expected their share of usage for a PC to be higher than that of their parents (means of percent allocation of expected usage for parents = 35% and teenagers = 65%; $z = 5.05$, $p < .01$).

At the dyad level, 28% of the sample was mother–son, 27% mother–daughter, 25% father–son, and 20% father–daughter. Although on average teenagers perceived themselves as more knowledgeable than parents, the opposite was true for the father–daughter dyads (mean for fathers' perceived knowledge = 4.20 and daughters' perceived knowledge = 3.50; $t(47) = 2.15$, $p = .04$). The largest knowledge gap was among the mother–son dyads, in which the teenagers had higher perceived knowledge (mean for mothers' perceived knowledge = 3.17 and sons' perceived knowledge = 4.87; $t(69) = 5.65$, $p < .01$), and the smallest gap was among the father–son dyads (mean for fathers' perceived knowledge = 4.26 and sons' perceived knowledge = 4.55; $t(61) = .85$, $p = .40$). For mother–daughter dyads, the members' levels of perceived knowledge were also not sig-

Table 2
PARAMETER ESTIMATES: COMPUTER

Attributes	Initial Preference: Parents Mean ($\bar{\beta}_p$)	Initial Preference: Teenagers Mean ($\bar{\beta}_t$)	Attribute Revision: Parents Mean ($\bar{\gamma}_p$)	Attribute Revision: Teenagers Mean ($\bar{\gamma}_t$)	Attribute Concession: Parents Mean ($\bar{\phi}_p$)
Computer brand	1.73	1.23	.59	.76	.50
	(.33)	(.26)	(.13)	(.11)	(.12)
Microprocessor brand	1.58	.97	.53	.44	.37
	(.24)	(.20)	(.15)	(.12)	(.13)
Microprocessor speed	2.28	2.30	.53	.87	.42
	(.31)	(.22)	(.16)	(.15)	(.12)
Warranty	4.26	3.18	.72	.63	.34
	(.46)	(.29)	(.12)	(.10)	(.16)
Price	–2.09	–.78	.85	.74	.77
	(.30)	(.23)	(.14)	(.10)	(.11)

Notes: Numbers in parentheses are posterior standard deviations.

nificantly different (mean for mothers' perceived knowledge = 3.20 and daughters' perceived knowledge = 3.68; $t(66) = 1.45$, $p = .15$).

Aggregate Parameter Estimates

Table 2 reports the aggregate parameter estimates (posterior means across all individuals) for the proposed model. We used every tenth draw from the last 50,000 (total = 100,000) draws of the Metropolis–Hastings algorithm to obtain these estimates. We used time series plots of the empirical draws to assess convergence of the sampling chain. The first two columns in Table 2 report the initial preference estimates for parents ($\bar{\beta}_p$) and teenagers ($\bar{\beta}_c$). Because we used dummy coding for all five attributes listed in Table 1, a positive (negative) preference parameter estimate for a given attribute should be interpreted as the first level (see Table 1) being more (less) desirable than the second.

In Table 2, both parents and teenagers, on average, prefer an IBM PC to eMachine, an Intel Pentium III microprocessor to an AMD K6-2, a 600-MHz microprocessor to a 433-MHz microprocessor, a two-year warranty to no warranty, and a price of $1,299 to a price of $1,799 (prob = .01).[1] However, there are differences in preferences between parents and teenagers. For example, teenagers, on average, have a lower brand preference for an Intel microprocessor (.97 versus 1.58; prob = .01) than their parents. Also, teenagers are less sensitive to warranty (3.18 versus 4.26; prob = .01) and price (–.78 versus –2.09; prob < .01). Both parents and teenagers, on average, appear to be equally sensitive to the microprocessor speed feature (2.28 versus 2.30; prob = .39) and the computer brand (1.23 versus 1.73; prob = .11). Note that these aggregate estimates are the means across the sample and therefore provide no information about preference estimates of a given parent (or teenager).

The next two columns in Table 2 report the attribute revision estimates for parents ($\bar{\gamma}_p$) and teenagers ($\bar{\gamma}_t$) at the aggregate level. Recall that an attribute revision estimate close to 1 indicates no revision and an estimate equal to 0 indicates complete revision in the direction of the other member. For the first three attributes—namely, computer brand, microprocessor brand, and microprocessor speed—parents exhibit large preference revision (.59, .53, and .53, respectively) in the direction of the teenagers' preferences. The estimates suggest that parents tend to become less computer and microprocessor brand sensitive after talking to the teenagers. For warranty and price, parents exhibit much lower revision in their preference (.72 and .85). The estimates therefore suggest that parents remain price sensitive after talking to teenagers. The attribute revision estimates for teenagers indicate that they revise their preference for microprocessor speed (.87) the least and microprocessor brand (.44) the most.

The last column of Table 2 reports the parents' attribute concession ($\bar{\phi}_p$) estimates. Recall that an attribute concession estimate of 1 implies no giving in by parents to teenagers' preferences and an estimate of 0 implies complete giving in. Notice that for three of five estimates, the attribute concession estimates are less than .5. This implies that parents, on average, concede more to teenagers' preferences on these three attributes—namely, microprocessor brand (.37), microprocessor speed (.42), and warranty (.34). However, regarding price (.77), parents tend not to concede much to teenagers' preferences.

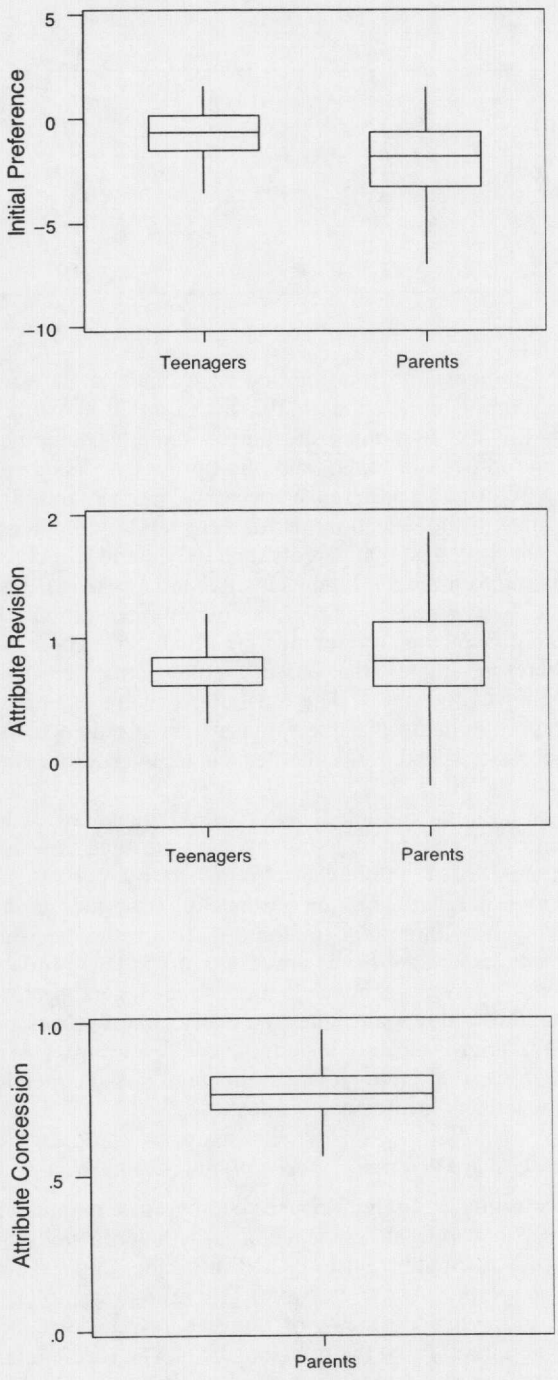
Heterogeneity in Preference, Revision, and Concession

The preceding discussion focuses on aggregate parameter estimates. We also found evidence of large heterogeneity in preferences, attribute revision, and attribute concession across the sample. As an example, Figure 2 presents box plots for individual estimates of preference, revision, and concession pertaining to the price attribute. The rectangular area in each box plot represents the interquartile range of the distribution. The lines on each side of the rectangle extend 1.5 times the interquartile range. For a normal distribution, this is equivalent to a 99% confidence interval.

In Figure 2, the results pertaining to initial preference (top panel) suggest that though parents, on average, are more price sensitive (i.e., preference estimates are more negative) than teenagers, there is large heterogeneity in the sample. Across the sample, there are some teenagers who are more price sensitive than some of the parents. Furthermore,

[1]The "prob" value is one minus the probability that the absolute difference between parameter estimates is greater than 0. It could be viewed as the Bayesian equivalent of a p-value. We evaluated the prob value empirically from the available draws (Arora and Allenby 1999; Rossi, McCulloch, and Allenby 1996).

Figure 2
DISTRIBUTION OF INITIAL PREFERENCE, ATTRIBUTE REVISION, AND ATTRIBUTE CONCESSION: COMPUTER PRICE



although both teenagers and parents, on average, do not revise their price sensitivities (i.e., the revision estimates are close to 1.0), there are teenagers and parents who do revise (middle panel). Across the sample, teenagers appear to be more homogeneous (i.e., a tighter box plot) than parents with regard to attribute revision. The portions of attribute revision box plots above the 1.0 mark show that the price sensitivities for several parents and teenagers tend to become more extreme (i.e., they become even more price sensitive) after the discussion. Finally, although on average there is evidence for little concession made by parents (i.e., attribute concession close to 1.0) with regard to price, the degree of attribute concession varies across the sample (bottom panel).

Given the large heterogeneity in attribute preference, revision, and concession, we next examine changes from initial to revised to joint preferences for four selected dyads. We selected these dyads to demonstrate different patterns in preference evolution that may exist. Figure 3 exhibits patterns of preference evolution with regard to the computer brand for the selected dyads. For the sake of clarity, we used individual posterior means to create Figure 3. Dyad 1 demonstrates convergence of preferences between the two members. The teenager in this example has a higher initial preference for IBM than the parent (prob = .07). However, the revised preference of the teenager is not different from that of the parent (prob = .52). Divergence is observed in Dyad 2. That is, although the parent's initial preference for IBM is not higher than the teenager's (prob = .18), her revised preference is (prob = .06). In Dyad 3, the teenager does not revise his preference (prob = .50) but concedes to the parent (prob = .07). Finally, each member retains his or her original preference throughout the decision process in Dyad 4. The revised preference for both the parent and the teenager in Dyad 4 is not different (prob = .40 and .49, respectively) from their initial preferences. The variety of patterns in Figure 3 therefore sheds light on how decomposition of revision and concession contributes to a better understanding of the underlying group decision process.

Shifts in Relative Importance

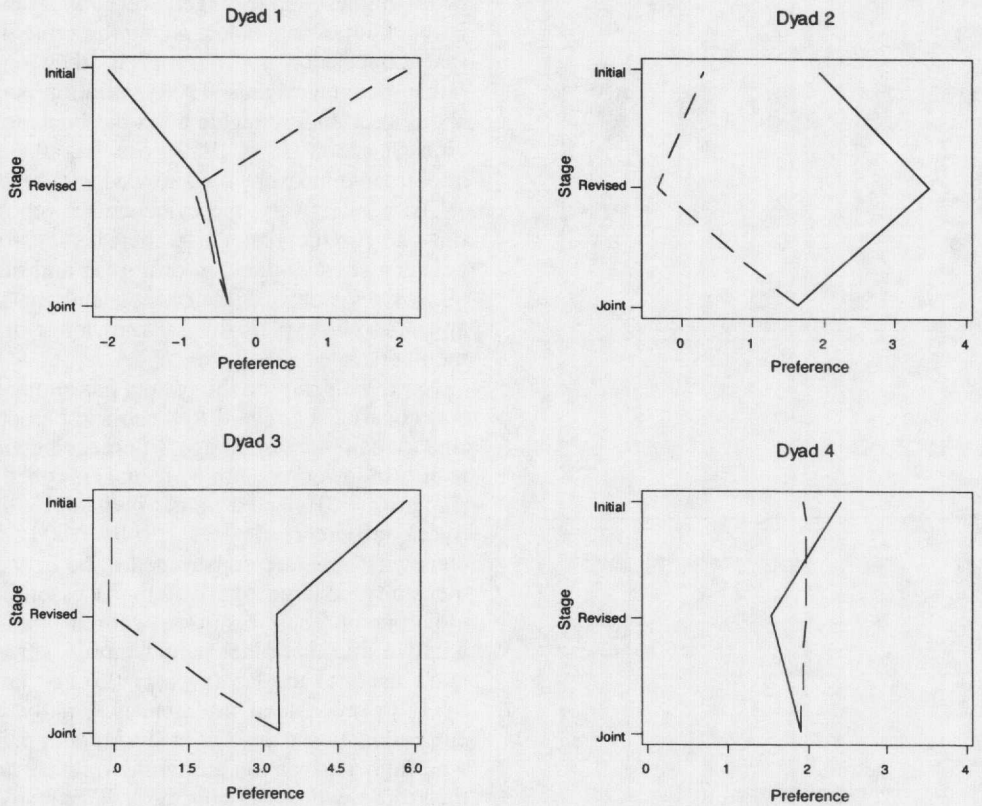
Preference revision, in our proposed model specification, occurs at the level of an attribute. A useful feature of our methodology is that it enables us to investigate how the relative importance of attributes changes during the decision-making process. The relative importance (ρ_k) of an attribute k is constrained between 0 and 1 and is traditionally defined as follows (Vriens 1995):

$$\rho_k = \frac{|\beta_k|}{\sum_l |\beta_l|}. \quad (13)$$

Because ρ_k is a function of the model parameters, using Equations 1, 3, and 13, we evaluated initial and revised relative importance for each member during the Markov Chain Monte Carlo estimation.

Even though the aggregate estimates for initial preferences (Table 2) indicate that parents are significantly more sensitive to microprocessor brand and warranty than teenagers, the (aggregate) relative importance of these two attributes was not found to be significantly different between parents and teenagers. In contrast, the relative importance of microprocessor speed turns out to be significantly different (parents = .18 and teens = .27; prob < .01), though the associated initial preferences of parents and teenagers reported in Table 2 appear to be the same. We also find that after discussion, parents' relative importance for computer brand declines from .14 to .07 (prob = .03) and for microprocessor speed increases from .18 to .24 (prob = .04). Teenagers' relative importance for microprocessor brand, conversely, increases from .12 to .16 (prob = .08) and for

Figure 3
SELECTED EXAMPLES OF GROUP DECISION PATTERNS: COMPUTER BRAND



Notes: Solid line represents parent, and traced line represents teenager.

warranty reduces from .37 from .31 (prob = .10). Finally, at the joint decision stage, the relative importance of price for the dyads is higher than the teenagers' revised relative importance of price (.18 versus .12; prob = .01).

Interesting patterns also emerged when relative importance was studied at the member level. As an illustration, Figure 4 presents shifts in relative importance for two chosen dyads. For the dyad in the top panel, the parent appears to increase her relative importance for microprocessor brand in light of the teen's relative importance. This shift occurs at the expense of relative importance of computer brand. For the dyad in the bottom panel, the teenager appears to exhibit high inertia with regard to relative importance of microprocessor speed, even though the parent cares less about this attribute. A similar pattern holds for the price attribute as well. For both these attributes, the teenager's relative importance also appears to override the parent's at the joint decision stage. These results therefore demonstrate that our model can easily capture changes in a member's relative importance during the group decision process.

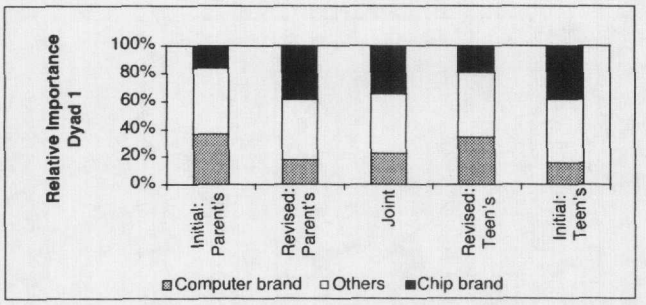
Covariate Analysis

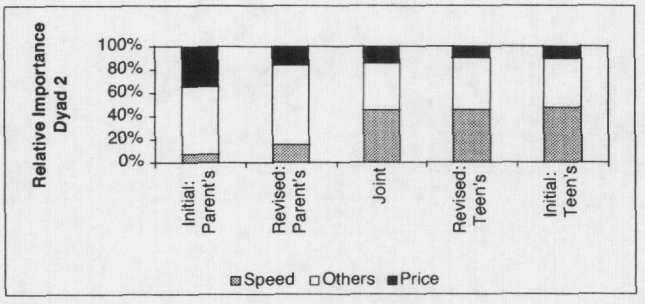
Next, we added a layer of covariates to the hierarchical model in an attempt to detect any association between model parameters and selected covariates. We accomplished this (Arora and Allenby 1999) by replacing $\bar{\gamma}_t$ with $\Theta_1 z$, $\bar{\gamma}_p$ with $\Theta_2 z$, and $\bar{\phi}_p$ with $\Theta_3 z$ in Equations 10 and 11. Estimates of Θ_1, Θ_2, and Θ_3 then provide evidence of any association between the selected covariates (z) and revision/concession parameters. The first three covariates relate to sex mix of the dyads. For these covariates, we used dummy coding (0/1) to characterize the four possible sex combinations (mother–son, father–son, mother–daughter, and father–daughter), and mother–son combinations served as the comparison point. The other two covariates included in this analysis were age difference (parent's age – teenager's age) and parents' education. The results are reported in Table 3.[2]

We begin with a discussion of analyses relating to sex mix. The results pertaining to teenagers' revision suggest that teenagers in the father–son dyads tend to revise more than teenagers in the mother–son dyads (i.e., –.15 versus 0; prob = .04). Similarly, teenagers in the mother–daughter dyads tend to revise more than teenagers in the mother–son dyads (i.e., –.14 versus 0; prob = .06). The results pertaining to parents' revision, however, suggest that mothers in the mother–son dyads revise more than the parents in father–son, mother–daughter, and father–daughter dyads (0 versus .17, .20, and .17; prob < .01). Interesting patterns also emerge when we examine the association between sex mix and attribute concession, because parents in the mother–son

[2]This analysis estimates a common revision and a common concession parameter across attributes. Similar results, available from the authors on request, are obtained when the analysis is repeated at the attribute level.

Figure 4
SELECTED EXAMPLES OF RELATIVE IMPORTANCE SHIFTS: COMPUTER





dyads appear to concede the most (0 versus .18, .14, and .21; prob < .05).

This pattern of results appears to be driven by relative knowledge of members in a dyad. As indicated previously, the relative knowledge of parents is the lowest among the mother–son dyads and highest among the father–daughter dyads. These findings are consistent with the covariate analysis results that parents' revision and concession tend to be the highest and teenagers' revision tends to be the lowest in the mother–son dyads. Along the same lines, we also find that concession by parents is the lowest among the father–daughter dyads. The covariation between knowledge about a certain product and sex has been documented in previous research (Herr 1989). Sex has also been used as an unobtrusive measure for knowledge (Peracchio and Tybout 1996). Collectively, the evidence we report shows that for the PC product category, there is a strong relationship between sex composition of a dyad and the model parameters of revision and concession and that this relationship appears to be explainable by knowledge difference between members.

Next, we examine the results pertaining to the remaining two covariates of age difference and parents' education. We find that an increase in age difference between the members results in lower revision by teenagers (positive coefficient of .17; prob = .01) and a higher revision by the parents (negative coefficient of –.11; prob = .04). Given that the teenagers' ages are constrained to be between 15 and 18 in the study, a large age difference essentially indicates an older parent. These results appear reasonable, because in our data we find that older parents are less likely to be the primary users of the PC (prob = .05) and are therefore more likely to revise their preferences. Finally, we find that parents' education is also related to model parameters. Parents with higher education are found to revise and concede more than those with lower education. This result is not driven by product knowledge, because no knowledge difference was found between the two groups (p = .19). However, research in family decision making suggests that parents with higher education levels have a more flexible orientation toward their children (Wickrama et al. 1998). Such parents may be more accepting of teenagers' product-related opinions and preferences.

Table 3
COVARIATE ANALYSIS

	Attribute Revision[f]		
Covariates	*Teenagers*	*Parents*	*Attribute Concession*[g]
Father–son[a]	**–.15**	**.17**	**.18**
	[.96]	(.99)	(.99)
Mother–daughter[b]	**–.14**	**.20**	**.14**
	[.94]	(1.00)	(.95)
Father–daughter[c]	–.08	**.17**	**.21**
	[.86]	(.99)	(.99)
Age difference[d]	**.17**	**–.11**	.05
	(.99)	[.96]	(.76)
Parents' education[e]	.05	**–.12**	**–.20**
	(.74)	[.96]	[1.00]

[a]Father–son dyad = 1, otherwise = 0.
[b]Mother–daughter dyad = 1, otherwise = 0.
[c]Father–daughter dyad = 1, otherwise = 0.
[d]Age difference = parent's age – teen's age.
[e]Parents' education is parameterized as an indicator variable, where parents with at least complete college education = 1, otherwise = 0.
[f]Positive coefficient implies a lower revision and vice versa.
[g]Positive coefficient implies a lower concession and vice versa.
Notes: () indicates the probability that the coefficient is positive. [] indicates the probability that the coefficient is negative. Boldface indicates that the probability exceeds .9.

Table 4
SWEET SNACK ATTRIBUTES AND LEVELS

Attributes	*Levels*
Brand	Brand 1
	Brand 2
	Brand 3
Size	Fun size
	Multipack
	Miniature
Price	$3.59
	$2.99
	$2.39

In summary, the results from Study 1 indicate that estimates of revision and concession vary substantially across attributes and dyad members. The analyses reported show how the proposed approach allows an examination of shifts in relative importance of attributes during the decision process. We observed a variety of revision and concession patterns at the dyad level, and these patterns appear to be associated with demographic variables such as sex, age, and education. In Study 2, our primary goal was to investigate the relationship between concession and postdecision satisfaction. Study 2 was carefully designed to accomplish this goal and enabled us to investigate the impact of preference convergence on concession. Because we used a different product category in Study 2, we compared attribute revision and concession across Studies 1 and 2.

STUDY 2

The product category used for this study was a frequently consumed sweet snack. Table 4 reports the three sweet snack attributes and the corresponding levels used in the study. Brand name identities are not revealed, as was requested by the funding source of the study. Overall, Study 2 followed a similar structure to Study 1. As in Study 1, respondents were instructed to provide strictly their own preferences through a conjoint task in Steps 1 and 3. Unlike in the previous study, a *rating task* involving nine full profiles was used instead of a choice task. In Step 4, dyads were asked to make joint choices from sets of three available alternatives. By design, these alternatives were constructed using full profiles that the members rated during Step 3. As explained subsequently, this enabled us to infer a member's concession in each choice task. Dyads were instructed that they would be purchasing and consuming the chosen alternatives jointly. In total, they made six such choice decisions.

We included an additional step to enable us to customize the final set of questions in order to obtain a measure of each member's satisfaction with the decision outcome. While the members were asked to respond to an individual-level questionnaire including measures of demographic and individual difference variables (Step 5), we recorded the alternatives the dyads chose in Step 4. In the additional step, each member was presented the six alternative sets and the jointly chosen alternatives. For all six choices a dyad made, each member was asked to report his or her satisfaction with the chosen alternative.

The jointly chosen alternative and the member's satisfaction with the joint decision were of primary interest in this study. We measured satisfaction with the joint choice on a nine-point, bipolar scale with anchors of 1 = "extremely dissatisfied" and 9 = "extremely satisfied." The key distinction of Study 2 from Study 1 was that we directly obtained utilities on a 1–100 scale so that we could use Equation 12 to infer concession made by a member during each choice decision. For example, from the three available alternatives, we assume that a dyad jointly selected the first alternative. Using the parent's rating for all three alternatives (provided on a 1–100 scale in Step 3), the difference between the highest utility alternative and the jointly chosen alternative (Equation 12) provided the inferred measure of the parent's concession.

Data Collection

Data were collected in an eastern university town. Again, the questionnaire was first pretested on 12 teenagers and 10 parent–teen dyads. After the pretest, a total of 123 parent–teen dyads participated in the study. The study was run for six consecutive weekends, with 20 one-hour sessions on each weekend. Of the 123 parent–teen dyads, data collected from 6 dyads were not usable because of a high percentage of missing values or inconsistencies among participants' responses. For the analyses reported in the article, data from the remaining 117 dyads were used.

Participating dyads received $20 for their participation, and $5 was donated for each parent–teen dyad to the organization that helped in the recruitment of the specific participants (e.g., church youth groups). Three lottery prizes ($250, $150, and $100) were included as incentives to increase participation, and three randomly chosen parent–teen dyads were awarded at the end of the study.

Sample Profile

In the sample, the median ages of teenagers and parents were 15 and 45, respectively. There were more mothers (70.1%) than fathers and more girls (59.8%) than boys. There was a good representation of same-sex (59%) and mixed-sex (i.e., father–daughter or mother–son) dyads. At the dyad level, 25.6% of the sample was mother–son, 44.4% mother–daughter, 14.5% father–son, and 15.4% father–daughter. The household income for the participating dyads was high: 55% of the parents reported an annual income level above $65,000. On average, teenagers reported higher consumption of the sweet snack (mean consumption rate for parents = 2.1 and teenagers = 3.3 times/week; $F(1, 233) = 15.11$, $p < .001$), and the sweet snack was a more important product category for teenagers (means on a 1–9 scale, where 9 represented "more important"; for parents = 4.1 and teenagers = 5.8; $F(1, 232) = 51.41$, $p < .001$).

Parameter Estimates

Table 5 reports the aggregate parameter estimates for the proposed model for Study 2. We used the last 10,000 of the total 20,000 draws from the Gibbs sampler to obtain these estimates. As before, the first two columns report the initial preference estimates for parents and teenagers. Given that there are three levels for each attribute, two estimates for each attribute are reported. Brand 3, miniature packaging size and a price of $2.39, is the "base" level in the dummy coding used (see Table 4). The results in Table 5 suggest that parents, on average, prefer Brands 1 and 2 to Brand 3 (prob < .01). Teenagers, however, prefer Brands 1 and 2 (over Brand 3) to a lesser degree (prob < .01). Parents prefer a miniature and a fun-size pack to the multipack (prob <

Table 5
AGGREGATE PARAMETER ESTIMATES: SWEET SNACK

Attributes	Initial Preference: Parents Mean ($\bar{\beta}_p$)	Initial Preference: Teenagers Mean ($\bar{\beta}_t$)	Attribute Revision[a]: Parents Mean ($\bar{\gamma}_p$)	Attribute Revision[a]: Teenagers Mean ($\bar{\gamma}_t$)	Attribute Concession: Parents Mean ($\bar{\phi}_p$)
Brand					
Brand 1	12.48	3.83	.92	1.00	.49
	(3.15)	(2.98)	(.03)	(.03)	(.04)
Brand 2	11.88	4.89			
	(2.90)	(2.23)			
Size					
Fun-size	.03	1.57	.92	.91	.45
	(.29)	(.41)	(.07)	(.08)	(.09)
Multipack	–4.51	1.39			
	(1.14)	(1.09)			
Price					
$2.99	–3.99	–2.55	1.07	1.01	.47
	(.59)	(.42)	(.09)	(.10)	(.07)
$3.59	–9.66	–8.74			
	(1.26)	(1.02)			

[a]Revision and concession are estimated at the attribute level.
Notes: Numbers in parentheses are posterior standard deviations.

.01), whereas teenagers prefer a fun-size pack to the miniature (prob < .01). As expected, lower prices are preferred to higher prices by both members (prob < .01).

The next two columns in Table 5 report attribute revision estimates for both parents and teenagers. Although there are two preference parameters associated with each attribute, we estimated one revision and concession estimate per attribute because our focus is attributes (not attribute levels). From the results of this study (Table 5), the most striking difference from the previous study is that both parents and teenagers do not revise their preference much. This should not come as a surprise, given that the product category used in this study is frequently purchased and respondents are therefore likely to have strongly held preferences. The last column of Table 5 reports the parents' attribute concession estimates. Overall, the attribute concession estimates are slightly below .5, suggesting that both parents and teenagers concede about equally when making purchase decisions in this product category. As in the PC study, we found evidence of large heterogeneity in preferences, attribute revision, and attribute concession across the sample.

Relationship Between Preference Convergence and Concession

We argue previously that the size of difference in members' revised preferences should affect the amount of concession they need to make. To test such a relationship empirically, we obtained a preference difference measure as follows:[3]

1. At each iteration of the Gibbs sampler, compute $\Sigma_k|\beta^R_{pk} - \beta^R_{tk}|$ as a measure of difference in revised preference for each dyad.
2. At each iteration, given the dyad measures of preference difference, compute the average preference difference across dyads.
3. At each iteration, assign each dyad to either a high– or a low–preference difference group depending on whether it is above or below the average obtained in Step 2.
4. Across all iterations, compute the assignment probability of each dyad belonging to the high–preference difference group by dividing the count in Step 3 by the total number of iterations.
5. Classify each dyad as a high–preference difference group if its assignment probability is above the median for the study sample.

A one-way analysis of variance, with parents' concession as the dependent variable and preference difference as the independent variable, was significant ($F(1, 116) = 9.98$, $p < .01$). The average concession for the high–preference difference group was 11.73, compared with 5.92 for the low–preference difference group. A similar pattern emerged when teenagers' concession was used as the dependent variable. The average concession for the high–preference difference group was 9.53, compared with 4.57 for the low–preference difference group ($F(1, 116) = 7.10$, $p < .01$). The results therefore provide evidence that a higher difference in preferences results in higher concession by members.

Relationship Between Concession and Postdecision Satisfaction

To test the link between preference concession and postdecision satisfaction, we used the inferred measure of individual concession (described previously) during the joint choice decision stage. The following regressions were used to investigate the link between satisfaction and concession:

$$\text{Satisfaction}_{\text{Parent}} = \lambda_{0p} + \lambda_{1p}\text{Concession}_{\text{Parent}} + \lambda_{2p}\text{Concession}_{\text{Teen}} + \lambda_{3p}(\text{Concession}_{\text{Parent}} \times \text{Concession}_{\text{Teen}}) \text{ and}$$

$$\text{Satisfaction}_{\text{Teen}} = \lambda_{0t} + \lambda_{1t}\text{Concession}_{\text{Teen}} + \lambda_{2t}\text{Concession}_{\text{Parent}} + \lambda_{3t}(\text{Concession}_{\text{Parent}} \times \text{Concession}_{\text{Teen}}).$$

In the regression equation for parents, we find that parents' satisfaction is significantly related ($\hat{\lambda}_1 = -.05$, $p < .01$) to their own concession and the interaction term ($\hat{\lambda}_3 = .001$, $p = .01$). However, $\hat{\lambda}_2$ is not significantly different from zero.

[3]The reported analysis accounts for uncertainty in parameter estimates. An analysis that relies on point estimates results in a similar conclusion. Treating the independent variable as continuous does not change the results either.

The R^2 for this regression is 25% ($F(3, 701) = 76.37$, $p < .01$). In the regression equation for teenagers, we find that teenagers' satisfaction is negatively related ($\hat{\lambda}_1 = -.053$, $p < .01$) to their own concession, the parent's concession ($\hat{\lambda}_2 = .006$, $p = .09$), and the interaction term ($\hat{\lambda}_3 = .001$, $p = .003$). The R^2 for this regression is 20% ($F(3, 701) = 58.28$, $p < .01$).

These results show that both parents and teenagers are less satisfied with the joint choice decision when their concession is high. More important, concession, when reciprocated by the other member in the dyad, results in higher satisfaction. Also, the results show that teenagers are more satisfied when parents' concession is high. One possible explanation for this may be that concession by parents may have two opposing effects on teenagers' satisfaction: On the one hand, consideration for the parent suggests that a teenager would want to minimize the parent's total concession. On the other hand, the teenager's desire to "win" is likely to have an opposing effect. The results from Study 2 involving a frequently consumed sweet snack suggest that the teenagers' desire to win has a stronger impact than consideration for their parents' preferences.

Decomposing Influence into Revision and Concession

Because our proposed model decomposes the traditional attribute influence measure into attribute revision and concession, we next assess the relative contribution of attribute revision and concession on attribute influence. In particular, we are interested in investigating the difference in relative contribution of attribute revision and concession by the two product categories in Studies 1 and 2. To conduct this investigation, we obtained individual estimates of relative influence by evaluating ω_{pk} (Equation 6) at each iteration of the Gibbs sampler. We then assessed relative contribution of attribute revision and attribute concession to the attribute-specific influence measure using regression analysis. Attribute revision (γ_{tk}, γ_{pk}) and attribute concession (ϕ_{pk}) are the independent variables in this regression, and attribute influence (ω_{pk}) is the dependent variable. To assess relative contribution, we examine the additional variance explained (R^2) by attribute revision when attribute concession is already in the regression model.

For Study 1, which involved a computer, attribute concession (ϕ_{pk}) explains approximately 21% of the variance in attribute influence (ω_{pk}). The additional variance explained by attribute revision (γ_{tk}, γ_{pk}) is approximately 67%. In contrast, for the sweet snack, attribute concession (ϕ_{pk}) explains approximately 66% of the variance in attribute-specific influence (ω_{pk}). The additional variance explained by attribute revision (γ_{tk}, γ_{pk}) is only 31%. Therefore, this comparison shows that the relative contribution of attribute revision and concession to attribute influence varies greatly by product category. Given that a computer is a high-involvement product compared with a sweet snack, the higher variance explained by attribute revision in computer purchases may result from the increased motivation to search for (Bloch, Sherrell, and Ridgway 1986) and process (Sengupta, Goodstein, and Boninger 1997) information. In addition, because higher involvement is associated with greater commitment to brand choice (Beatty, Homer, and Kahle 1988), a consumer is more likely to make a concession on a low-involvement product such as a sweet snack.

DISCUSSION

A majority of prior research in the area of group decision making in marketing has focused on understanding factors that determine member influence. In this article, we propose a shift in focus by decomposing member influence into two distinct components: preference revision and concession. An investigation of preference revision and concession resulted in fresh insights into the buying process of a group. We found that converging preferences because of revision affect a member's concession, which in turn affects postdecision satisfaction.

Our findings have implications for both buyers and sellers. From the buyer's standpoint, the article points to two possible strategies to maximize satisfaction with a joint purchase (involving, for example, a piece of furniture, an appliance, or an automobile): preference revision and concession reciprocity. Preference revision as a strategy refers to an active effort by a buyer to update own preferences in light of what others in the group like or dislike. Such a strategy advocates the need for careful comprehension of others' preferences and, in response, a flexibility to adjust own preference. By adopting preference revision as a strategy, a member decreases the need to concede, thus increasing the odds of "buying into" the joint decision. Concession reciprocity, in contrast, suggests the need to sacrifice own preference in response to a sacrifice made by others. This strategy encourages both members to be fair in their give-and-take, because such fairness is likely to result in higher postdecision satisfaction.

Our findings pertaining to preference revision and concession reciprocity have important implications for the seller as well, because purchase satisfaction affects merchandise return, repeat business, and word-of-mouth communication. This is best illustrated in the context of a salesperson selling, for example, a cellular telephone service to a husband–wife dyad. The salesperson in this example could begin by asking the husband and wife to express their individual preferences. This would serve two purposes: (1) expose members to each other's preferences and (2) inform the salesperson about the degree of convergence between the members' preferences. The salesperson could then provide objective product information designed to facilitate preference revision on the relevant attributes by dyad members. However, some disagreements between dyad members may still persist after the discussion. In such a case, both members should be encouraged to make equal concession. Our results across the two studies suggest that the effectiveness of salesperson strategies to encourage revision versus concession may depend on the product category or the dyad. Specifically, for some product categories or dyads for which individual preferences are well formed, all effort should be directed to promoting equal concession rather than increasing revision.

Prior research in nonmarketing areas that relates to preference revision and concession has focused on formal decisions in the organizational context. Group decision processes in this stream of research are mainly investigated at the level of a choice alternative. Furthermore, revision is predominantly studied as an external intervention (e.g., group decision support systems) that could improve the effectiveness of group decisions. Several key contributions of our article in light of the extant literature are noteworthy. First, we investigate the role of preference revision and con-

cession in the context of a purchase decision by viewing revision as a natural component of the decision process. Second, we examine revision and concession not only at the level of a choice alternative but also at the attribute level. Third, by using a hierarchical Bayes model, we show that both preference revision and concession vary substantially across group members, product attributes, and product categories. Fourth, we show that recognizing and modeling such interpersonal differences is of great practical relevance because both revision and concession appear to be strongly related to demographic variables such as sex, age, and education. Such demographic hooks facilitate targeting dyads that are more likely to revise and/or concede with advertising messages and salesperson contact.

We end the article by pointing to some limitations of this research and suggesting avenues for further research. First, although attribute revision in this article is driven entirely by others' preferences, information external to the dyad (e.g., a Web search) may also result in a preference change. A more elaborate model (and data collection effort), which incorporates information internal and external to the dyad, could be developed to examine how different types of information contribute to preference revision and how they interact. Second, our model is conceptualized at the dyadic level, whereas group decisions often involve more than two members. Because of the generality of the basic ideas of revision and concession, future applications of the proposed model could be extended to larger groups. Third, group members use several influence strategies (e.g., persuasion, bargaining, emotional) in an attempt to get what they want (Palan and Wilkes 1997; Spiro 1983). Further research should investigate how each influence strategy affects preference revision and concession and, in turn, postdecision satisfaction. In light of our article, it appears that some influence strategies encourage preference revision (e.g., persuasion, expert) and others encourage concession (e.g., bargaining, directive, emotional). Fourth, given that joint choices in the context of a family are made regularly, the impact of revision and concession in the current joint decision on the next decision may be another avenue for further research. On the basis of Corfman and Lehmann's (1993) work, for example, it is plausible that concession by a member in the current decision may be negatively related to his or her concession in the next decision.

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