ORGANIZATIONAL BEHAVIOR AND HUMAN DECISION PROCESSES
Vol. 66, No. 3, June, pp. 251–267, 1996
ARTICLE NO. 0054

Perspective-Taking Judgments of Medication Acceptance: Inferences from Relative Importance about the Impact and Combination of Information

CELIA E. WILLS

College of Nursing, Michigan State University

AND

COLLEEN F. MOORE

University of Wisconsin, Madison

Perspective-taking judgments of medication acceptance were studied for hypothetical mental health treatment scenarios. Three types of information were manipulated in all possible subsets: level of trust in the medication prescriber, severity of the hypothetical mental health condition being experienced, and the potential side effects of the medication. Subjects made judgments from four perspectives: self perspective and that of three other hypothetical people who were each said to place the most importance on one of the three cues. The results showed individual differences in self-reports of the relative importance of the cues which, in turn, predicted differences in judgment patterns. Subjects modified their cue use when making judgments from the perspectives of hypothetical others. The interaction patterns and rank orders of the perspective-taking judgments resembled the individual differences in judgments made from subjects' own perspectives, but the perspective-taking judgments showed extreme effects of the most important cue. There was also some influence of subjects' own perspectives on their perspective-taking judgments. When only a subset of the three cues was given, the judgment pattern depended on the importance of the cue that was omitted. The relative weight averaging model accounted for the judgments of only a minority of the subjects. Models which propose that subjects infer the value of missing information were also unsuccessful in explaining the data of the majority. Modifications of those models are proposed.

The relationships between people's self-reports and their judgment and decision-making processes are important to understand for everyday situations. Self-report data can be a major source of information for inferring how people make decisions or wish to make decisions. For example, health care professionals may seek people's opinions about the importance of various factors that they may consider as part of their decision making about health treatments. Health care professionals may use the importance reported by patients in order to predict people's health decisions, to plan individualized educational and counseling interventions, and to serve as a basis for collaborative decision making with patients.

The nature of the relationship between people's self-reports of the relative importance of information and their actual judgment and decision-making processes has been controversial (Ericcson & Simon, 1980; Nisbett & Wilson, 1977; Slovic & Lichtenstein, 1971). It has been found that the self-reports of relative importance can be used to predict at least some aspects of judgment and decision processes (Anderson, 1982; Anderson & Zalinski, 1991; Goldstein & Beattie, 1991; Goldstein & Mitzel, 1992; Goldstein, Beattie, & Barlas, 1993; Levin, Johnson, & Chapman, 1991; Reilly & Doherty, 1989, 1992; Surber, 1985; Wills & Moore, 1994). Based on a review of the literature available at that time, as well as the findings of an experiment, Surber (1985) concluded that self-reports of cue importance should be viewed as reflecting the overall effect of a cue on judgment, rather than the weights derived from the fit of a particular model. We will follow this usage and will refer to self-reported cue importance, rather than using the term "weight." Research since 1985 appears to be consistent with Surber's (1985) conclusion.

An important issue in collaborative decision-making contexts such as health care is the ability of people to

Address correspondence and reprint requests to Celia E. Wills, R.N., Ph.D., College of Nursing, Michigan State University, A202 Life Sciences, East Lansing, MI 48824-1317.

0749-5978/96 $18.00

infer the relationships between the self-reported importance of a cue to a person and that person's judgment and decision making processes. In some health care situations, as well as in other settings, an agent (such as a health care provider) is called on to make a judgment or decision on behalf of or in consultation with another person, the client or principal. For example, an investment broker needs to know a client's relative preferences for balancing factors such as risk, growth, and current income. A forestry manager makes decisions based on the relative importance of factors such as timber production, wildlife habitat preservation, and recreation opportunities communicated by the land owner, a supervisor, or the U.S. Congress. A health care provider recommends specific treatment options based on information provided by the patient about the relative importance of factors such as the undesirable side effects of the treatment, desire for relief from the affliction, cost of the treatment, and the efficacy of the treatment in the short and long term. In the extreme case of power of attorney for health care decisions, a designated agent makes all health care decisions for another based on prior directives. Agents and their principals need to communicate with each other in order for the agent to make judgments and decisions which reflect the principal's preferences. It is important to know how the relative importance information provided by the principal will influence the *agent's* judgment on behalf of that principal.

In perspective-taking, judges may rely on the relative importance information supplied by others as a basis for taking the perspectives of those people. For example Person A (the agent or perspective-taker) would use relative importance information from Person B (the principal or client) in order to make judgments from the perspective of Person B. The goal of the agent is to infer what the principal's judgments would be as accurately as possible. In order to do this, the agent must accurately infer the nature of the relationship between relative importance information and judgment or decision making processes for the principal. Two conditions must hold in order for agent judgments to resemble the principal's own judgments. First, the principal's own judgments must be related to self-reported cue importance. If this is not true, then the principal's reported cue importance would not be useful to the agent. Second, the agent must effectively use the principal's reported cue importances to make judgments that resemble the principal's judgments. Therefore, in order to study perspective-taking it is important to have a setting in which there are individual differences in reported cue importance, and which are related to individual differences in judgments. Given such a setting, a central issue is the degree to which perspective-taking judgments made for principals who report different cue importances will resemble individual differences in cue use by those principals.

The relationship between the perspective-taking judgments of agents and how clients or principals make judgments has been explored only to a limited extent (Goldstein & Beattie, 1991; Goldstein & Mitzel, 1992; Rothert, 1982; Rothert & Talarcyzk, 1987). This topic is especially important in health care situations because research has shown that health care professionals and patients often do not agree about the nature of health-related decision making (Lund & Frank, 1991; Rothert, 1982). Raymark *et al.* (1995) concluded that the accuracy of surrogates making health care decisions for patients is quite poor. The present study examined how people infer the judgments of others in a health treatment situation on the basis of reported relative importance of information. We examined judgments for a health care setting because of the intrinsic importance of the topic (virtually all people are recipients of health care at some point in their lives), and also because individual differences have been found in the relative importance of cues in health care judgments (Viet, Rose, & Ware, 1982; Wills & Moore, 1994).

In the present study each participant judged the likelihood that he or she would accept a medication for a hypothetical mental health condition in a variety of situations. The mental health condition and the potential negative side effects of the hypothetical medication were described as varying in severity. The degree of trust in the health care provider prescribing the medication was also varied. Each research participant made judgments first from his or her own perspective and then for three other hypothetical individuals who were described as placing the most importance on one of each of the three cues. Following the judgments, each person also made a self-report of the relative importance of each cue compared to the other cues for his or her own judgments. We expected that in the self-perspective there would be individual differences in the self-reported relative importance of the cues, and that those differences would be reflected in the judgments made for oneself. If obtained, such results would extend the literature showing that self-reports of relative importance are predictive of judgments.

The second major goal was to examine how individuals use the purported relative importances of others in perspective-taking judgments. Goldstein and his colleagues (Goldstein & Beattie, 1991; Goldstein & Mitzel, 1992) showed that purported relative importances influenced predictions of another's preferences. Research on "feedforward" has also shown that information

about cue importance does influence cue use (Bjorkman, 1972; Steinmann, 1974; see Balzer, Doherty, & O'Connor, 1989 for a review). But most studies of feedforward did not attribute the cue importance to another person; rather, the cue importances were descriptive of the structure of the task. Based on these previous studies, we expected that perspective-taking judgments would be influenced by the purported relative importances. Because we expected individual differences in the self-perspective judgments, however, it is possible to examine the degree to which the perspective-taking judgments vary in a way that resembles the individual differences in the subjects' own judgments. For example, do the perspective-taking judgments for a person purported to place most importance on trust resemble the judgments of those who reported trust to be the most important variable in their own judgments?

A third important issue is the degree to which one's own perspective provides a bias or "restrictive lens" which interferes with one's ability to take the perspective of another. For example, when taking the perspective of someone for whom trust is most important, will the perspective-taking judgments of an agent who regards another cue (e.g., side effects) as most important be similar to the perspective-taking judgments of an individual who regards trust as most important for his or her *own* perspective? In order to examine this question it is necessary to have a context in which the people show individual differences in their own judgments which are related to their self-reports.

Fourth, we examined how people respond to partial information in making judgments about a health treatment. In Anderson's (1982) information integration approach, partial information trials provide a test of the relative weight averaging model and allow identifiability of the weight parameters if certain assumptions hold. However, it has been proposed that people sometimes infer cues that are omitted (Jagacinski, 1991, 1994; Levin, 1985; Levin & Johnson, 1982; Levin, Johnson, & Faraone, 1984; Surber, 1984, 1985; Yamagishi & Hill, 1981). If values are inferred for omitted information, then it is difficult to test the averaging model versus other models. It is possible that perspective-taking judgments will differ from self judgments in how omitted cues are treated. Such differences would be important because of the ubiquity of judgment and decision making with only partial information (Hogarth & Kunreuther, 1995).

In sum, we examined four major questions: (a) Are there individual differences in the reported relative importances of trust, side effects, and severity of mental health condition for judging the likelihood of medication acceptance, and do the reported relative importances predict individual differences in judgment patterns; (b) to what extent do perspective-taking judgments based on purported relative importances resemble the differences in judgments between subjects who report different cues to be most important; (c) do the reported relative importances of cues for subjects' own judgments influence perspective-taking judgments; and (d) how is omitted information treated in health care judgments and is it treated differently in one's own judgments as opposed to in perspective-taking judgments?

METHOD

Research Participants and Procedure

The participants were 155 undergraduate volunteers (99 females, 56 males) who were currently enrolled in introductory psychology courses. Participants received extra credit points toward their course grades for participation in the study. Participants completed study booklets in groups of 25 to 30. All participants finished the study materials within an hour.

Materials and Design

In the materials which participants read, they were instructed to imagine themselves as having a mental health problem for which they were seeking professional assistance. They were also instructed to imagine that they had received a prescription for a medication to treat the mental health condition, and that they were deciding about whether or not to take the medication. Next, they were told to imagine how three other hypothetical people might make the same decision about the medication. The three hypothetical individuals were described as people who differed in which of three types of information they considered to be the *most* important consideration for making a decision about taking the medication.

Participants then read detailed descriptions of the three types of information: level of trust in the health care provider prescribing the medication (trust), severity of potential side effects of the medication (side effects), and severity of the mental health condition (severity of condition). The three types of information were identified on the basis of a literature review as factors which are important considerations in decision making about acceptance of a health treatment (Amdur, 1979; Becker, 1979, 1985; Blackwell, 1976; Eraker, Kirscht, & Becker, 1984; Gerber & Nehemkis, 1986; Haynes, Taylor, & Sackett, 1979; Rosenstock & Kirscht, 1979; Sackett, Haynes, & Tugwell, 1985). The descriptions of the information were written to be real-

istic depictions for a mental health treatment situation. The content validity of the descriptions was critiqued by several professionals with expertise in mental health treatment. The descriptions of the information were also described as "realistic" in two subsequent studies by students and psychiatric inpatients who had personal experiences with mental health difficulties and making decisions about medications prescribed for treatment of their mental health problems (Wills, 1995). Trust was described as the level of faith in the medication prescriber. Potential side effects were described as possible adverse effects of the medication. Severity of condition was described as how much the mental health condition might influence daily functioning (emotional, physical, occupational, and social) and well-being. Trust descriptions were summarized as low, moderate, or high. Severity of condition and side effects descriptions were summarized as mild, moderate, or severe.

After reading about the stimuli and judgment task, subjects then made a series of judgments of the likelihood that the medication would be accepted. For each stimulus combination, each participant first rated the likelihood that he or she personally would accept the medication, and then rated the likelihood that each of the three hypothetical others (those who thought trust, severity of condition, and side effects most important, in that order) would accept the medication. An example stimulus would be:

- Assume that you have a *severe* mental health condition.
- The medication may have *mild* side effects.
- You have *low* trust in the person who is prescribing the medication.

—SELF
—TRUST as most important
—SEVERITY OF CONDITION as most important
—SIDE EFFECTS as most important

Design. The stimuli of the main design were constructed from a 3 (Trust) × 3 (Severity of Condition) × 3 (Side Effects) factorial design, creating 27 stimulus combinations. In addition to the main three-way factorial design, six subdesigns were included, which consisted of the possible two-way combinations of variables in the absence of the third variable (Trust × Severity of Condition, Severity of Condition × Side Effects, and Trust × Side Effects), and the one-way designs in which each type of information was presented by itself (trust only, severity of condition only, and side effects only). Participants also made judgments of nine representative warm-up trials, which included three of each of the three-way, two-way, and one-way stimuli. Two random orders of stimuli were used.

Rating scale. Participants used a 19-point rating scale. A 1 indicated "no chance of accepting the medication," a 10 = "completely undecided about whether or not would accept," and 19 = "absolutely certain that would accept the medication." The scale can be conceptualized as two 9-point scales, where ratings of 1 to 9 indicate "nonacceptance" and ratings of 11 to 19 indicate "acceptance."

Reported importance of variables. Following their judgments of all the stimulus combinations, participants made ratings of the relative importances of the three variables for their own judgments only, using a pairwise comparison method. Each variable was rated in comparison to each other variable, for a total of three comparisons, using an 11-point rating scale. The numbers 1 and 11 were labeled as "very very much more important" and a 6 was labeled as "equally important."

RESULTS

A preliminary analysis was done in order to determine if the gender of the participants was significantly related to the perspective-taking judgments, or to judgments made from the self perspective. Gender had no significant effects or interactions (no p values $< .01$). We used .01 for these preliminary tests because of our relatively large sample size and the lack of any theoretical basis for predicting gender differences.

Reported Importance Groups for Self-Perspective

Participants were classified according to the type of information that they reported to be most important in their own judgments. Those who reported two types of information to be equally important were classified in the equal importance group. No participants reported that all three types of information were equally important. Participants for whom the rank order of importance for the three types of information was not

TABLE 1

Reported Importance Groups and Sample Sizes

Information reported most important	*N*	Sample (%)
Side effects	29	18.7
Severity of condition	42	27.1
Trust	32	20.6
Equal importance	24	15.5
Intransitive	28	18.1

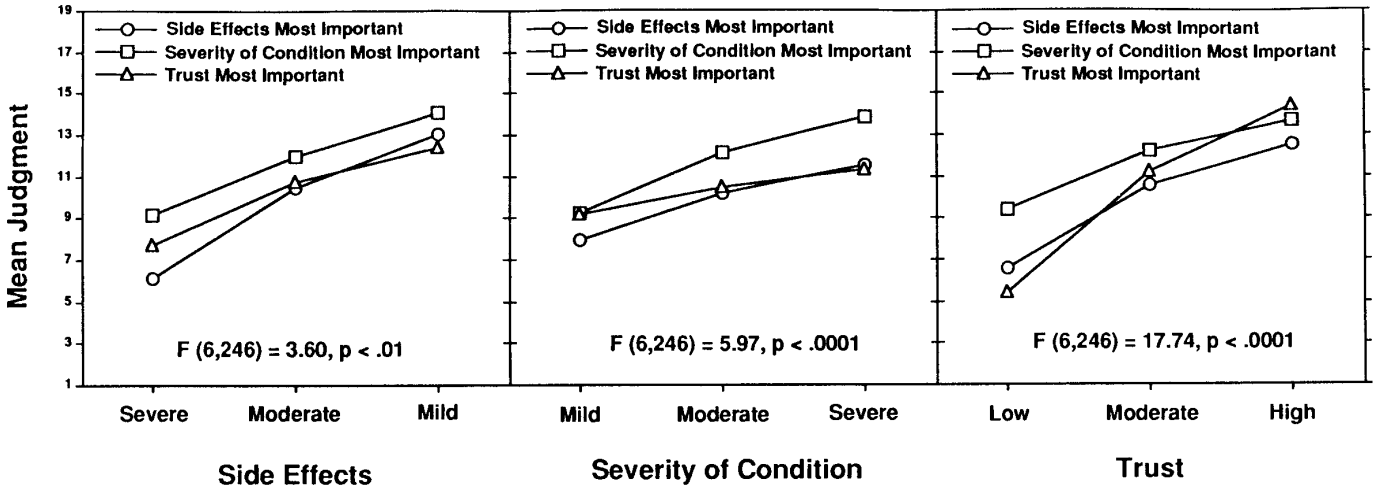

FIG. 1. Main effects for the three types of information, for subjects in the trust, severity of condition, and side effects importance groups. The panels (left to right) present the main effects for the importance groups for each type of information (side effects, severity of condition, and trust). The *F* values on each panel are for the Group × Type of Information interactions. Data are from the three-way design for the self-perspective.

consistent were classified in the intransitive group. (The majority of the intransitive participants had intransitive importance ratings by only 1 scale point and expressed nearly equal importance of two cues). The reported importance groups formed in this way and the resulting sample sizes are presented in Table 1.

We examined the differences among the reported importance groups in how the three types of information are used in the self judgments. If reported importance group membership is systematically associated with the actual impact of information in judgments, then the largest net effect of a type of information (e.g., trust) should occur for the reported importance group for which that information is most important in judgments (e.g., the trust importance group).

Figure 1 presents the main effects from the three-way design for the three reported importance groups in which trust, side effects, and severity of condition were reported to be the most important types of information in judgments, respectively.[1] The steepest curve in each panel is for the reported importance group for which that information was most important. For example, in the right-hand panel, the steepest curve for trust occurs for the trust importance group. Analogous relationships hold for the severity of condition variable (center panel) and for the side effects variable (left-hand panel). The interactions of Reported Importance Group × Type of Information in a 4 (Reported Importance Group) × 3 (Trust) × 3 (Severity of Condition) × 3 (Side Effects) ANOVA were all significant (*F*s included on each panel; the intransitive group was excluded). These interactions show that reported importance group is predictive of the net impact of the cues on the judgments.

Figure 2 presents the means of all 27 stimuli for the reported importance groups in which side effects, severity of condition, or trust were most important. Differences in cue importance between the reported importance groups can also be seen in Fig. 2. For the trust group (bottom panels in Fig. 2) the sets of curves in the three panels differ on the ordinate, indicating high reliance on the trust cue. For the side effects group (top panel) the curves in each panel are more widely spread vertically than for the other groups showing the emphasis on the side effects cue.

The three-way interaction of Trust × Severity of Condition × Side Effects was significant, $F(8, 894) = 8.12$, $p < .0001$. The shape of the interaction was similar for the three reported importance groups (the interaction of Group × Trust × Severity of Condition × Side Effects was small, $F(24, 984) = 1.55$, $p < .05$). In the high trust panels (right-hand side of each row) the curves converge as severity of condition goes from mild to severe. A converging interaction is consistent with Kelley's (1972) "multiple sufficient causes" schema in which the presence of either of two variables is sufficient to produce an effect. When trust is high, subjects judge that they are likely to accept the medication if

[1] The equal importance and intransitive groups were also analyzed. The results were qualitatively similar to those of the other importance groups. The results of these groups are not presented because they do not bear directly on the perspective-taking questions examined later.

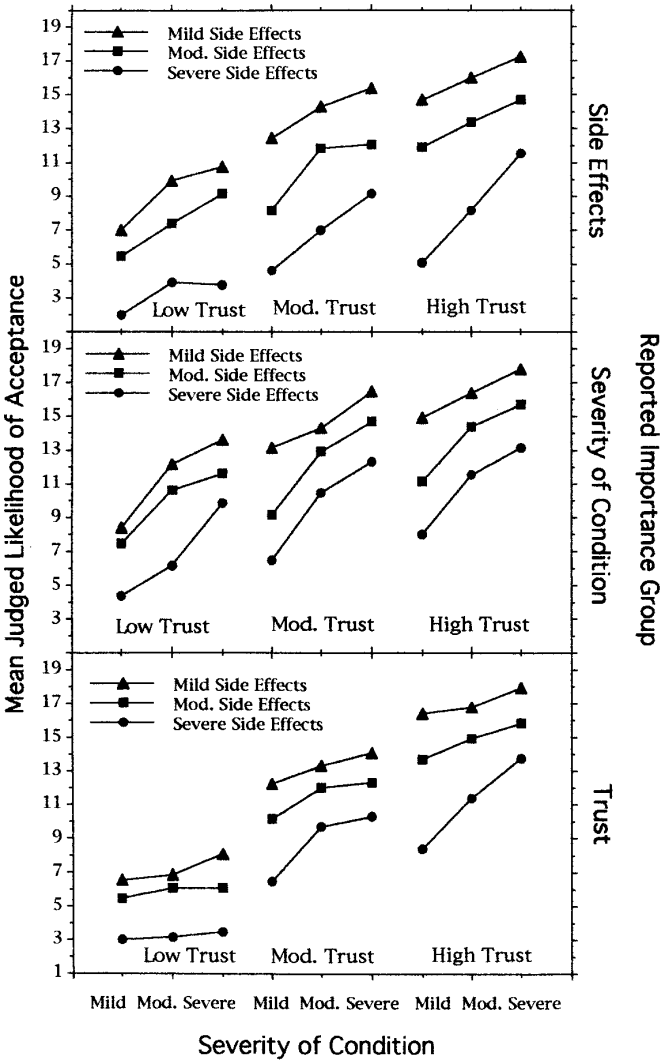

FIG. 2. Three-way interactions for the side effects (top row), severity of condition (center row), and trust (bottom row) importance groups. The left, center, and right-hand columns present the Severity of Condition × Side Effects interactions for each level of trust (low, moderate, and high). Data are from the three-way design for the self-perspective.

either side effects are mild or the mental health condition is severe. In contrast, consider the low trust panels (left-hand side). For two of the groups the curves diverge as severity of condition changes from mild to severe. This diverging pattern is consistent with Kelley's "multiple necessary causes" schema. Subjects judge that they are likely to accept a medication only if two conditions both hold: relatively mild side effects and a relatively severe mental health condition. Such configural effects of information have been found in two previous studies of judgments in health care situations (Viet *et al.*, 1982; Wills & Moore, 1994).

The configural effects in Fig. 2 could be due to distortion in the use of the response scale, or to the way in which the information is combined. The responses are assumed to preserve the rank order of unobservable impressions produced by the combination of the information. Therefore, if a rank-order preserving (monotonic) transformation can eliminate the interactions, then the source of the interactions cannot be determined; they might be due to either monotonic distortion of the response scale or the way the information is combined. On the other hand, if a monotonic transformation cannot eliminate the interactions, then they cannot be entirely due to monotonic distortion of the response scale and can be attributed to some aspect of the way the information is combined.

Using MONANOVA (Kruskal & Carmone, 1969), we attempted to rescale the data in Fig. 2 monotonically in order to remove the interactions. The initial stress values (a measure similar to percentage of variance in the interaction) were .080, .098, and .085 for the severity of condition, side effects, and trust importance groups. The final stress values were .008, .092, and .063. Thus, the stress values were reduced by less than 26% by the monotone rescaling. The exception was the severity of condition importance group for which a degenerate solution was produced. In a degenerate solution, the monotonic rescaling is successful at eliminating the interaction, but only by imposing a step-function with only a few values on the data (Kruskal & Wish, 1978). Overall, the rescaling did not eliminate the interactions. Therefore, the rescaling results provide evidence that the interactions are due to the way the information is combined and are not due to the way that the subjects used the rating scale.[2]

Perspective-Taking Judgments

The second major hypothesis to be tested was that there would be systematic differences in judgment patterns that depended on perspective. First, the perspective-taking judgments of the three-way design for the total sample were analyzed in a 3 (Perspective) × 3 (Trust) × 3 (Severity of Condition) × 3 (Side Effects) ANOVA. All two-way and three-way interactions between perspective and the three types of information

[2] It could be argued that the interactions are due to "floor" or "ceiling" effects in use of the rating scale rather than configurality in combining the information. Floor and ceiling effects are always possible, and perhaps they could distort the rank order of the data if they are severe. Some aspects of the data are inconsistent with floor and ceiling effects as an explanation of configurality. Specifically, in the high trust panels the side effects importance group shows the largest Side Effects × Severity of Condition interaction, but also has means for mild side effects that are the farthest from the ceiling response of 19.

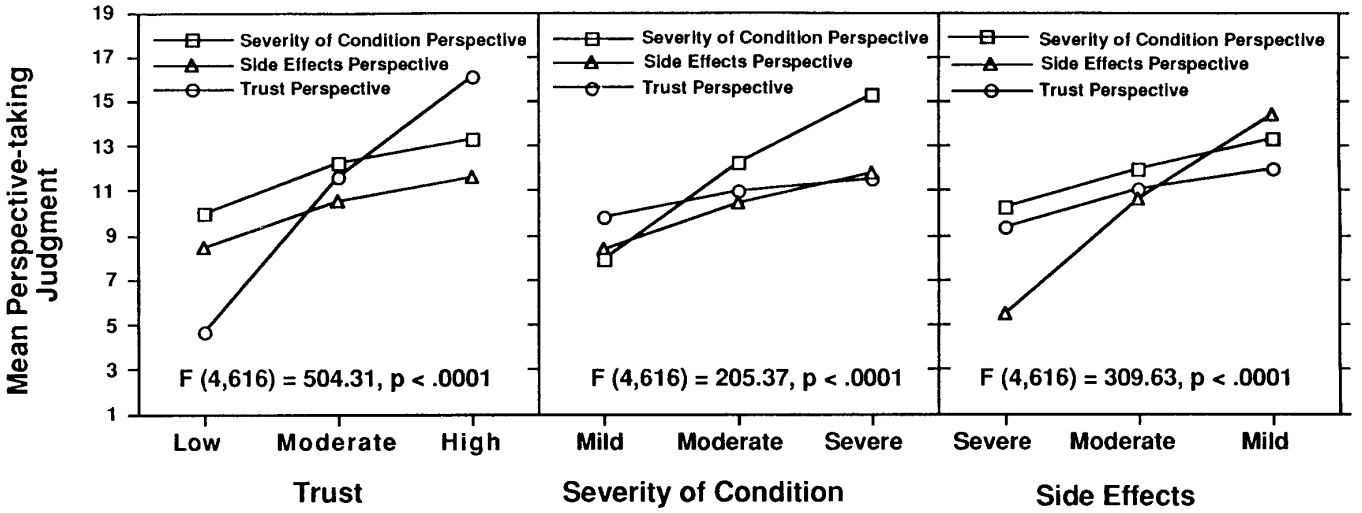

FIG. 3. Main effects for the three types of information for each set of perspective-taking judgments (Trust, Severity of Condition, and Side Effects Perspectives). The panels (left to right) present the main effects for each type of information (Trust, Severity of Condition, and Side Effects). The *F* values on each panel are for the Perspective × Type of Information interactions.

were significant (p's $< .01$). Thus, subjects inferred differences in the ways that the three hypothetical people would use the three types of information in judgments of medication acceptance.

If perspective is systematically associated with the actual impact of information in judgments, then the largest net effect of a type of information (e.g., trust) should occur for the perspective for which that information is most important in judgments (e.g., for the hypothetical person for whom trust is most important). Figure 3 presents the main effects of the cues from the three-way design for the three perspectives. As hypothesized, the largest effect of each type of information occurred for the perspective in which it was said to be most important. In the left-hand panel of Fig. 3, the trust perspective has the steepest slope for trust. Analogous effects occurred for severity of condition and side effects, as shown in the center and right-hand panels of Fig. 3, respectively. The effects in Fig. 3 are similar to those shown in Fig. 1 for the subjects' own judgments. The differences among perspectives in Fig. 3 are more exaggerated than the differences between the reported importance groups in Fig. 1, however. The results in Fig. 3 provide evidence that subjects can adjust the net impact of different cues when they adopt different perspectives.

Comparison of Self-Judgments and Perspective-Taking Judgments

Figure 4 presents the mean perspective-taking judgments for the 27 stimuli of the three-way design, plotted analogously to Fig. 2. The three-way interaction of Trust × Severity of Condition × Side Effects was significant, $F(8, 1232) = 15.38$, $p < .0001$. The shape of the interaction was similar across the three perspectives. The Perspective × Trust × Severity of Condition × Side Effects interaction was significant but was small, $F(16, 2464) = 2.27$, $p < .01$. Inspection of Fig. 4 shows that it is due primarily to a change in the sizes of the interactions with perspective. When trust is low (left-hand sides), the curves diverge as severity of condition goes from mild to severe. When trust is high (right-hand sides), the curves converge, as in the self-judgments. Overall, the perspective-taking judgments are qualitatively similar to the differences seen in the reported importance groups in Fig. 2. The three-way interactions were reduced by a maximum of 30% by MONANOVA, except for the trust perspective, for which a degenerate solution was produced. This result is similar to that for judgments made from subjects' own perspectives and supports interpretation of the interactions as due to configurality rather than response scale distortion.

In order to assess the degree to which the perspective-taking judgments resemble the patterns shown by the reported importance groups, we calculated the Spearman rank order correlations between the means. To the extent that the perspective-taking judgments resemble the judgments of the corresponding reported importance group (e.g., the trust perspective judgments and the self-judgments of the trust importance group) then the rank order correlations should be high. We used rank order correlations because they do not require assuming that subjects use the rating scale as

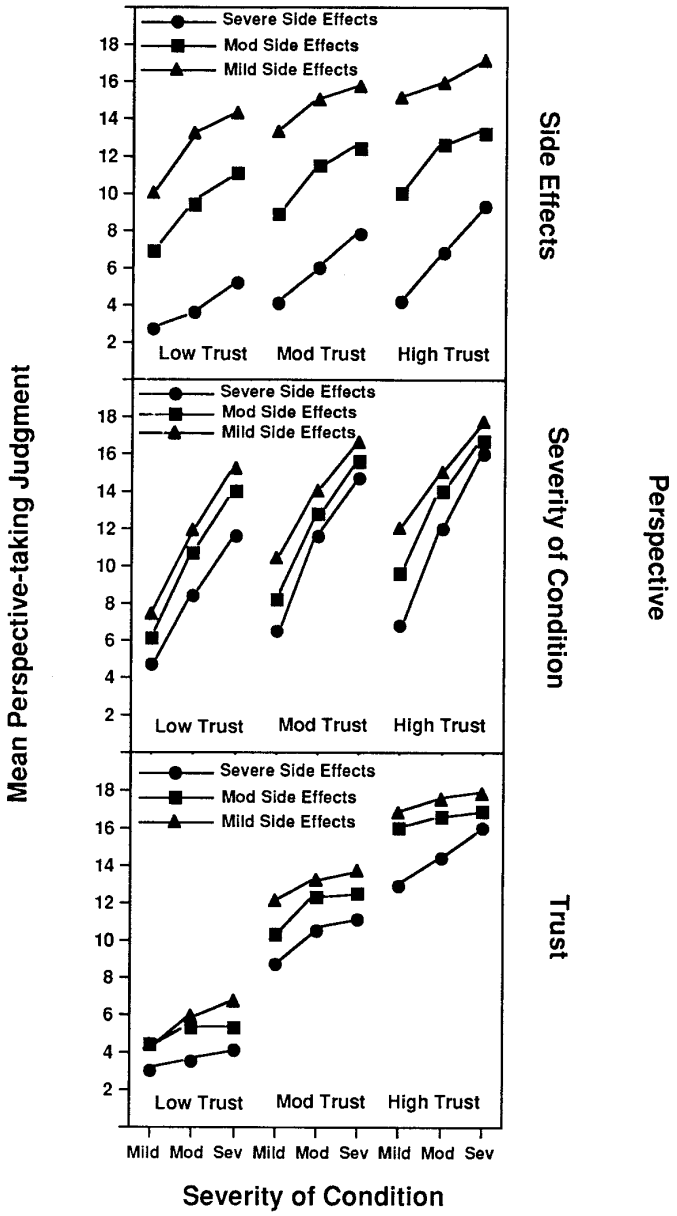

FIG. 4. Three-way interactions for the side effects (top row), severity of condition (center row), and trust (bottom row) perspectives. The left, center, and right-hand columns present the Severity of Condition × Side Effects interactions for each level of trust (low, moderate, and high).

an equal interval scale. The rank order correlations between corresponding perspective and importance group means all exceeded .9 (.964, .902, .928 for trust, severity of condition, and side effects, respectively). The rank order correlations across different perspectives were considerably lower (*r*'s = .607, .698, and .648 for side effects perspective-trust perspective, side effects perspective-severity of condition perspective, and severity of condition perspective-trust perspective, respectively). These analyses provide evidence that there is good rank order agreement between perspective-taking judgments and corresponding reported importance group judgments.[3]

Bias in Perspective-Taking

Is there evidence of significant bias of one's own point of view in the perspective-taking judgments? In order to examine the possibility of bias, we conducted a 4 (Reported Importance Group) × 3 (Perspective) × 3 (Trust) × 3 (Severity of Condition) × 3 (Side Effects) ANOVA of the perspective-taking judgments (the intransitive importance group was excluded). If one's own point of view influences perspective-taking, then significant interactions of reported importance group with the information cues would occur. Figure 5 shows the significant two-way interactions between the three reported importance groups and the three cues in the perspective-taking judgments. Although the effects are small, they consistently show that in the perspective-taking judgments each reported importance group showed a slightly steeper slope for the cue which it reported to be most important than did the other groups. For example, in the left-hand panel the trust importance group shows the steepest slope for trust. Analogous effects are seen in the other two panels. Thus, subjects carry over something of their own points of view in perspective-taking. No other interactions with reported importance group were significant in the perspective-taking judgments.

Effects of Omitted Cues

We included judgment trials with three cues, two cues, and one cue in order to test the relative weight averaging model (Anderson, 1982). The relative weight averaging model predicts that the slopes of the main effects of the cues should be ordered inversely to the number of cues present: one-way design steepest, three-way design flattest, and the two-way designs intermediate between the one-way and three-way designs. These predictions hold if participants give zero weight to information that is omitted, and the scale

[3] The same analyses were conducted using Pearson correlations and similar results were obtained. All *r*s for corresponding perspective and reported importance groups exceeded .9, and all *r*s between perspectives were below .75. In Lens Model terms, these correlations can be thought of as analogous to the achievement index where the judgment pattern of each relative importance group provides a criterion for perspective-taking accuracy. It should be noted that we did *not* match the purported relative importance information to the relative importance groups, and the subjects did not directly observe the judgments of anyone else. Therefore the Lens Model cannot be applied to measure perspective-taking accuracy.

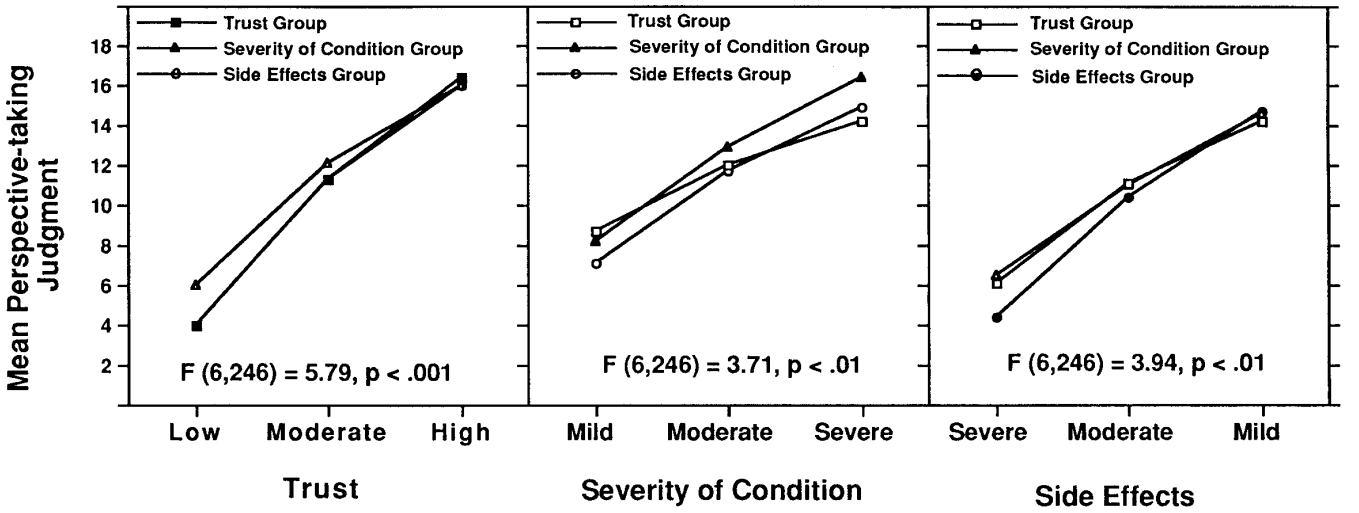

FIG. 5. The main effects of each type of information in perspective-taking judgments for each of three reported importance groups that reported one type of information to be most important in their own judgments. The *F* values on each panel are for the Reported Importance Group × Type of Information interactions.

values and weights are constant across designs. We assessed these qualitative predictions of the averaging model by examining the individual data. We took the difference in ratings between the two extreme stimulus values for each cue as the slope for that cue. For the three-way design this is the difference between the individual subject's main effect means for the extreme values (e.g., mild side effects minus severe side effects).

For judgments made from the self-perspective, only four individuals (2.6%) had slope patterns which agreed perfectly with the ordinal predictions of the averaging model. For the three types of perspective-taking judgments, only one individual in each perspective showed the perfect averaging pattern in the slopes.

Perhaps the slopes of the individual data are inconsistent with the averaging model because the two-way designs do not differ much in slope from either the three-way or one-way design. Therefore, for each cue we compared the slopes from the one-way design with the slopes from the three-way design. These results are presented in Table 2. The slope patterns of 54 individuals (35%) conformed to this prediction of the averaging model for all three variables for the self-perspective. For the perspective-taking judgments, fewer individuals were consistent with the averaging model (19, 12, and 15% for the trust, severity of condition, and side effects perspectives, respectively). The modal pattern in the perspective-taking judgments is for only one or none of the variables to agree with the slope predictions of the averaging model. Even for the self-perspective, there is not impressive evidence for the averaging model.

We also examined slopes from the one-way and three-way designs for consistency with the averaging model for each variable separately and for each reported importance group. There was only one significant difference due to reported importance group. Fewer individuals in the severity of condition group were consistent with the averaging model for the side effects variable. Table 3 presents the numbers of individuals with a steeper one-way than three-way slope for each variable for the self-perspective. The three variables are approximately equivalent in the percentage of individuals whose slopes agreed with the averaging model. Tests of the differences in proportions of slopes consistent with averaging for pairs of variables were all nonsignificant ($p > .20$) using McNemar's test (Siegel & Castellan, 1988). For the self-perspective,

TABLE 2

Numbers of Individuals Showing Different Patterns of Slope Consistency with Averaging Model

	Number of variables with slopes consistent		
Perspective	3	2	1 or 0
Self	54 (35)	57 (37)	44 (28)
Trust	29 (19)	55 (35)	71 (46)
Severity of condition	19 (12)	44 (28)	92 (59)
Side effects	23 (15)	54 (35)	78 (50)

Note. Percentages are in parentheses. Data are based on comparisons of slopes from the one-way and three-way designs.

TABLE 3

Numbers of Individuals Showing Slopes from One-way and Three-way Designs That Were Consistent or Inconsistent with the Averaging Model

Variable	Consistent	Inconsistent
Side effects	100 (65)	55 (35)
Severity of condition	106 (68)	49 (32)
Trust	103 (68)	52 (34)

Note. Data are from judgments made from the self-perspective. Values in parentheses are percentages.

there was no evidence of a difference between variables in the effects of omitted information.

For the perspective-taking judgments, Table 4 presents the numbers of individuals with one-way and three-way slopes consistent with the averaging model for each variable. What is most noteworthy is that for each perspective the variable corresponding to that perspective has the largest number of individuals with slopes consistent with the averaging model (e.g., the side effects variable in the side effects perspective). Tests of the differences in proportions consistent for pairs of variables within perspective were all significant (McNemar's test, $p < .01$) when one of the variables matched the perspective. This shows that significantly more participants had slopes consistent with the averaging model for the variable that matched the perspective than for the other two variables. When the differences in consistent proportions for the two variables not matching the perspective were tested (e.g., the side effects and severity of condition variables in the trust perspective), none of the differences were significant by McNemar's test ($p > .10$).

These results suggest that how the variables are combined depends on the perspective taken. Recall that in the three perspectives a maximum of 19% of the individuals showed the ordering of slopes for the one-way and three-way designs that is predicted by the relative weight averaging model for all three variables. The results in Table 4 show that whether a particular variable has a steeper slope in the one-way design than in the three-way design is strongly influenced by perspective.

This finding cannot be explained by giving the most important cue the largest absolute weight in a relative weight averaging model. The averaging model predicts that when the most important cue is missing (and is assumed to receive zero weight on those trials), then the remaining cues should have a larger effect than when combined with the most important cue. The majority of the sample showed an effect that is the *opposite* of this averaging model prediction. When the most important cue for a perspective was omitted, for the majority of the sample the remaining sources of information had significantly *smaller* effects than when combined with the most important cue.

This result is shown in Fig. 6 for those subjects whose slopes were not consistent with the averaging model across all three variables (82 to 88% of the sample across perspectives; see Table 2). The effects are most noticeable for the side effects and severity of condition perspectives (top and middle panels). For the severity of condition perspective (middle panel), the trust and side effects variables (right- and left-hand sides, respectively) have the flattest slopes for the designs in which severity of condition is not given (trust only, side effects only, and trust × side effects designs). Contrasts showed that these differences were significant. The trust-only curve was significantly flatter than the curve for trust combined with severity of condition ($t = -3.71$, $df = 135$, $p < .01$), the curve for trust combined with side effects was significantly flatter than the curve for trust combined with both side effects and severity of condition ($t = -2.68$, $df = 135$, $p < .01$), the curve for side-effects only was significantly flatter than the curve for side effects combined with severity of condition ($t = -3.37$, $df = 135$, $p < .01$), and the curve for side effects combined with trust was significantly flatter than the curve for side effects combined with both trust and severity of condition ($t = -7.26$, $df = 135$, $p < .01$). Analogous effects occurred for the other perspectives. Which slopes differ significantly from each other are shown by the subscripts on the captions in Fig. 6. Ten of 12 contrasts showed significantly flatter slopes when the most important cue for a perspective was omitted than when it was included.

The overall pattern of perspective-taking results for the majority of the sample is that: (a) the ratings for the single-cue design for the most important cue have a slope equal to or steeper than the slope in the three-cue design; (b) when the most important cue is omitted, the ratings based on less important cues have flatter

TABLE 4

Numbers of Individuals Showing Slopes from the One-Way and Three-Way Designs That Were Consistent with the Averaging Model

	Perspective		
Variable	Trust	Severity of condition	Side effects
Side effects	65 (42)	55 (35)	106 (68)
Severity of condition	71 (46)	89 (57)	58 (37)
Trust	114 (74)	67 (43)	69 (45)

Note. Percentages of the sample are in parentheses.

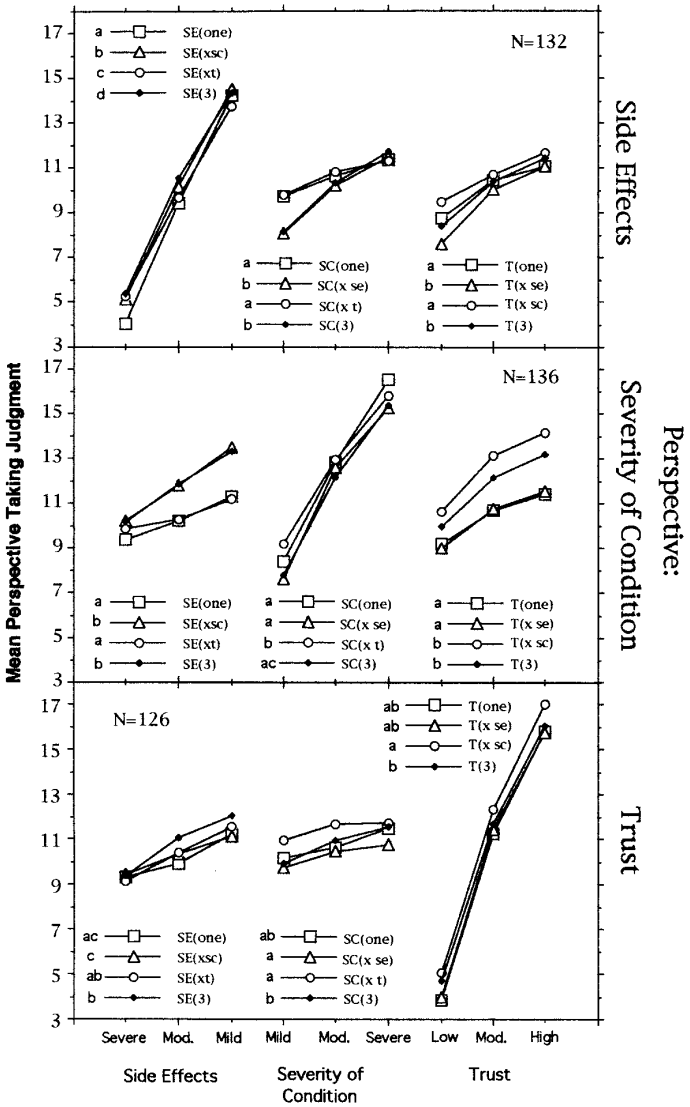

FIG. 6. Mean values for the main effects of each cue in each subdesign and in each perspective. Shared subscripts on the legend within each panel indicated that the slopes do not differ significantly. SE(one) indicates the side effects one-way design, SE(× sc) indicates the main effect of side effects in the side effects × severity of condition design, SE(× t) indicates the main effect of side effects in the side effects × trust design, and SE(3) indicates the main effect of side effects from the three-way design. The other legends are constructed analogously. (The means in each panel are based on those subjects whose slopes from the one-way and three-way designs were not consistent with the averaging model. See Table 2.)

slopes than when the same cues are combined with the most important cue.

Based on these results, we conclude that the relative-weight averaging model does not apply to the majority of participants making this type of judgment unless the model is modified. Another study in our laboratory (Wills & Moore, 1995) found that only 24% of the sample had slope patterns from single-cue and three-cue designs which conformed to the averaging model. The participants in the other study were also college students, but two-thirds of them had a chronic health condition (a mental health problem, or allergies, and/or asthma). They made judgments of the likelihood of medication acceptance from only their own perspectives for hypothetical scenarios given the same three types of information: trust, severity of condition, and side effects. Thus, the findings reported here are replicable.

Models for Partial Information Judgments

There are two models in the literature for predicting that the effect of a source of information is less when presented alone than when combined with other information: (a) Yamagishi and Hill's (1981, 1983) path-analytic or subjective multiple regression (SMR) model and (b) Johnson and Levin's (1985; Johnson, 1989) inferred values (IV) model. For the perspective-taking judgments of the present experiment, a successful model must simultaneously predict: (a) steeper single-cue than combination cue slopes for the most important cue and (b) flatter single-cue than combination cue slopes for the less important cues.

Subjective multiple regression model. The subjective multiple-regression model (SMR) for two cues can be written:

$$R = \frac{(r_{y1} - r_{12}r_{y2})}{(1 - r_{12}^2)} S_1 + \frac{(r_{y2} - r_{12}r_{y1})}{(1 - r_{12}^2)} S_2, \qquad (1)$$

where S_1 and S_2 are the subjective values of the two cues, and the rs represent subjective correlations. The subscript y represents the variable being judged (e.g., likelihood of taking a medication) and subscripts "1" and "2" represent the two cues. When only one cue is given, the SMR model reduces to $R = r_{y1}s_1$. Surber (1984) previously noted that the SMR model can predict that the effect of a single cue will be either greater than, less than, or approximately equal to the effect the cue has when combined with other information. A smaller effect of a single cue than a combination of two cues will occur when it is assumed that the two types of cues have either a relatively large positive correlation, or a negative correlation (i.e., r_{12} is relatively large, or r_{12} is negative). However, the SMR model cannot predict *both* a steeper single cue than combination effect for one type of information and a flatter single cue than combination effect for the other cue. When the subjective correlations are such that the single cue effect would be flatter than its combined effect for one

cue, then for the other cue the combined effect actually reverses direction (i.e., the slope of the other cue goes negative).

If it is assumed that a missing cue is inferred based on the subjective cue intercorrelation, the SMR model still cannot predict the effects seen in the perspective-taking judgments. As shown by Surber (1984, p. 251), the SMR model with an inferred value for missing information reduces to a simple expression involving the subjective correlation of the cue with the judged variable and a constant. That is, if cue 1 is given and cue 2 is inferred from cue 1 and the value of r_{12}, then the response is predicted to be a function of $r_{y1}s_1$ plus a constant. Therefore, assuming that missing information is inferred does not allow the SMR model to predict the perspective-taking judgments.

Inferred value additive model. Johnson and Levin's (1985; Johnson, 1989) inferred values (IV) model can be incorporated into either an additive or averaging model. A general additive model of information integration for two cues can be written:

$$R = w_1 s_1 + w_2 s_2, \tag{2}$$

where the ws are weights and the s are subjective values and R is the response on the rating scale. When only cue 1 is presented, this version of the IV model assumes that the value of cue 2 is inferred from cue 1:

$$s_2' = m s_1 + k, \tag{3}$$

where s_2' is the inferred value of cue 2, s_1 is the given value of cue 1, m represents the assumed relationship between cue 1 and cue 2, and k is a constant. One option in the IV model is for the inferred value to be weighted and combined with the given value as if it were the missing cue:

$$R = w_1 s_1 + w_2(m s_1 + k). \tag{4}$$

Therefore, the net effect of cue 1 presented alone will be $(w_1 + m w_2)s_1$.

Whether cue 1 alone has a larger, smaller or the same effect as when combined with cue 2 depends on the value of the product mw_2. If the two cues are assumed to be negatively related ($m < 0$), then the effect of cue 1 alone will be less than when it is combined with cue 2. This flattening of the slope of cue 1 when presented alone will be greater to the extent that cue 2 is more important (i.e., when the weight of cue 2 is larger). An analogous effect will occur when cue 1 is missing and is inferred from cue 2. The value of m should be the same regardless of which cue is missing because it represents the perceived cue intercorrelation. Notice that if one cue has a flatter slope when presented alone than in combination that the other cue should also have the same slope ordering. However, when the weights of the cues differ, the degree of difference between one-cue and combination-cue slopes will also differ across cues. Therefore, asymmetry across cues in the single-cue combined-cue slopes is predicted, but the direction of the difference in slopes should be the same. Because the direction of the effect is the same across cues, the additive IV model cannot predict our perspective-taking results.

Inferred value averaging model. The IV averaging model when only cue 1 is presented and cue 2 is inferred as in Eq. (3) can be written:

$$R = \frac{w_1 s_1 + w_2(m s_1 + k) + w_0 s_0}{w_1 + w_2 + w_0}, \tag{5}$$

where $w_0 s_0$ represents the weight and scale value of the initial impression (or impression in the absence of both cues), and the other parameters are as described earlier. The effect of cue 1 presented alone will be a function of $(w_1 + m w_2)/(w_1 + w_2 + w_0)$. When both cues are presented, the effect of cue 1 will be a function of $w_1/(w_1 + w_2 + w_0)$. The IV averaging model makes the same predictions as the IV additive model. If the value of m is constant regardless of which cue is missing, then the IV averaging model cannot predict the results of the present experiment.

Constant inferred value of missing information. Another option in the IV models is to assume that the value inferred for an omitted cue is a constant that is independent of the value given for the other cue. For example, an average value might be inferred for an omitted cue. The constant inferred value is then weighted and combined with the given information. Levin *et al.* (1984) presented two versions of the constant IV averaging model. If the weight of cue 2 when it is inferred is the same as if cue 2 were actually present, then the slope of cue 1 presented by itself should be parallel to the slope of the combination curves. If the weight of cue 2 when it is inferred is less than when the cue is actually presented, then the slope of cue 1 when presented alone should be steeper than the slope of the combination curves. Levin *et al.* (1984) noted that it is reasonable to give a lower weight to an inferred value than to the same cue when it is actually present. Giving lower weight to inferred values would yield flatter slopes for all single cues. Therefore, the

constant IV averaging model also cannot account for our results.

In summary, none of the models in the literature account for the perspective-taking results of the present experiment. In order to simultaneously predict a larger effect of one cue presented alone than in combination and a smaller effect of another cue alone than in combination using some form of IV model, it would be necessary for the basis of the inferred values to differ depending on which cue is omitted. For example, if the value of m is allowed to change signs depending on which cue is omitted, then either the IV averaging or additive model could predict our results. The meaning of the parameter *m*, which represents the subjective cue correlation, would then be unclear. For example, whey would one assume a negative relationship between severity of condition and trust when severity of condition is omitted, but assume a positive relationship between the same cues when trust is omitted?

Partial inferred values in an averaging model. One possibility for the present results is to assume that the averaging model applies, but that no inference (or a constant inference with small weight) is made for omitted cues when the most important cue is present. Second, assume that when the most important cue is omitted, it is inferred according to Eq. (3) with a negative value of *m* (the cue intercorrelation). This "partial" IV averaging model would predict the results of the present experiment, but does it make psychological sense? One appealing feature of the partial IV model is that no inferences are assumed to be made when the most important cue is present. The model represents the willingness of a person to make a judgment based on a small amount of information as long as that information is deemed important. A second appealing feature is that inference does occur when the most important cue is absent. By this the model represents the unwillingness of a person to make a judgment without at least an inference of the type of information deemed most important. Thus, the partial IV model has some intuitive appeal, and would successfully represent the results.

Labile weight averaging. Another option for predicting our results is to have labile weights (LW) in an averaging model. Under the LW averaging model, each cue would have a weight-adjustment parameter, δ, which is applied to the cue of less importance (cue 2) when the most important cue (cue 1) is omitted:

$$R = \frac{(w_2 + \delta)s_2 + w_0 s_0}{(w_2 + \delta) + w_0}. \qquad (6)$$

The value of δ would normally be less than zero. The value of δ and the *w*s would have to fall in a region such that $(w_2 + \delta)/(w_2 + \delta + w_0) < w_2/(w_1 + w_2 + w_0)$. This region is where the slope of cue 2 presented alone would be flatter than cue 2 when combined with cue 1. The intuitive appeal of LW averaging is that when the most important cue is missing a person is represented as reserving judgment by reducing the weight of available cues. This has the effect of giving the initial impression, $w_0 s_0$, a larger impact. A second appealing aspect of LW averaging is that many studies have shown that people can adjust the importance they give to cues depending on instructions, expertise (Shanteau, 1992), or other variables (Birnbaum, Wong, & Wong, 1976; Dixon & Moore, 1990; Jagacinski, 1994; Levin & Johnson, 1982). Changes in cue importance are most often represented as changes in weight parameters. Thus, LW averaging uses a process (weight adjustment) that has precedence. There are also two other precedents for LW averaging in the literature. In the differential-weight averaging model the weight of a cue depends on its scale value (Oden & Anderson, 1971). In configural weight averaging the weights of two cues are adjusted depending on which cue has the higher scale value (Birnbaum & Stegner, 1979).

The data of the present experiment do not distinguish between the LW averaging and partial IV models. The results do show that the most important cue is treated qualitatively differently than cues of less importance when some of the expected information is omitted. The partial IV and LW averaging models are two possible mechanisms through which this effect may occur. This difference in the way the most important cue and less important cues are used was more likely to occur for the perspective-taking than for the self-judgments. Future research could explore whether this is due to the fact that in the perspective-taking judgments higher weight was placed on the most important cue than in the self-judgments. An alternative is that it is due to a difference in processing strategies used in perspective-taking versus in the self-judgments.

DISCUSSION

There were four major results of the current study. First, there were individual differences in how important the three cues were for judgments of medication acceptance for treatment of a mental health condition, and those differences were related to self-reports of cue importance. Second, when making judgments from the perspectives of hypothetical others subjects adjusted their judgments such that the cue that was

purported to be most important had the largest net effect. The interaction patterns and rank orders of the perspective-taking judgments resembled the individual differences found for subjects' own judgments, although the perspective-taking judgments showed more exaggerated use of the most important cue. Third, there was some influence of a person's own point of view on perspective-taking. The group that reported a cue to be most important in their own judgments also gave that cue slightly more importance in perspective-taking than the other reported importance groups. Fourth, the way in which partial information is treated depends on the importance of the cues that are missing.

The finding that there were individual differences in the net impact of the cues and that those differences were predictable from self-reports of relative importance is consistent with previous research exploring the relationships between self-reports and individual differences in information use (Birnbaum & Stegner, 1981; Goldstein & Beattie, 1991; Goldstein & Mitzel, 1992; Levin *et al.*, 191; Reilly & Doherty, 1989, 1992; Surber, 1985; Wills & Moore, 1994). These results show that subjects are able to report accurately some aspects of how they make judgments about treatment acceptance in a laboratory situation. As mentioned in the introduction, some predictable relationships between self-reported cue importance and judgments are a prerequisite for effective use of reported cue importances by agents.

Effectiveness of Perspective-Taking

The second result was that subjects could modify their cue use when making judgments from the perspectives of hypothetical others. This finding suggests that health care professionals (as agents) might use relative importance information in order to better communicate and collaborate with health consumers, as well as to predict people's actual health care decision making. The present study showed that subjects altered which cues had the largest net effect when making judgments from the perspectives of others, but the perspective-taking judgments were consistently more exaggerated than subjects' own judgments. In the present study subjects received only crude information about the single cue a hypothetical other considered to be the most important. In many everyday decision making situations, it seems desirable that clients provide agents with more finely graded information about the relative importance of several cues.

An issue for further research is whether agents can work with more finely graded relative importance information. Future research could examine how, after receiving richer relative importance information, people might modify perspective-taking judgments initially based on sparse relative importance information. More than two decades ago working in the framework of social judgment theory, Hammond and Brehmer (1973) proposed that conflict in joint judgment tasks (called "interpersonal learning") could be reduced by giving people detailed information about their own and their judgment partner's judgment policies (including cue importance, the shape of the functions relating cues to the criterion, achievement, and consistency). Although the literature on interpersonal learning typically showed a rapid convergence of cue importances for pairs of subjects, research also showed that subjects have difficulty identifying individuals whose cue importances are similar versus different from their own (Hammond & Brehmer, 1973). Notice that in these studies subjects usually were not told the cue importances of their partners, and were not asked to predict their partner's judgments, but were asked to infer cue importances from the partner's behavior during the joint judgment task. Whether finely graded information about cue importance and an intervening step in which judgment partners explicitly predict each other's judgments (perspective-taking) would reduce what Hammond and Brehmer (1973) called "policy conflict" in judgment is an important issue with many practical implications.

Many people have experienced frustration in attempting to convey their cue importances to sales agents, and some of us have had similarly frustrating experiences with health care professionals. For many medications there are trade-offs among factors such as cost, symptom relief and side effects, and the severity of one's condition will obviously influence desire for symptom relief. The health care professional may take one's first expression as an extreme preference and exclude giving importance to other cues. After the patient is dissatisfied and returns for another appointment, the result is sometimes a verbal exchange in which the patient attempts to give richer information to the health care professional about cue importances: "I said I needed relief from my back pain, but I don't want the side effects of feeling drowsy and being constipated. I would only take this medication again if I were in agony." Whether such mutually frustrating encounters could be avoided by better initial communication about cue importance and the features of recommended treatments needs further research.

In the present study, there was some carry-over of a person's own point of view into the perspective-taking judgments. The cue reported to be most important in subjects' own judgments had a slightly larger effect in their perspective-taking judgments than in the per-

spective-taking judgments of other groups of subjects who did not report that cue as most important for their own judgments. This result is consistent with previous research in which source credibility enhanced the impact of the information provided by that source (Birnbaum *et al.,* 1976; Birnbaum & Stegner, 1979). The subjects' own points of view might be conceptualized as lending increased credibility to particular cues. In this conceptualization, the cues that are especially credible or given high importance in a person's own judgments may be magnified in effect and function as a systematic influence in perspective-taking judgments. This finding serves as a warning to agents to be careful to separate their own viewpoints regarding cue importance from those of their principals. Although the bias was small in our results, in a situation such as when one has the power of attorney for another's health care decisions, it is especially important to be aware of the possibility of the intrusion of one's own perspective.

The configural effects of information in judgments of medication acceptance for self- and perspective-taking judgments were similar. This finding is encouraging evidence of good perspective-taking, but should be tested more thoroughly in a future study. The correspondence in configurality between self- and perspective-taking judgments could be partly a carry-over of the self-perspective into the perspective-taking task. This interpretation could be tested in a setting in which the type of configurality differs markedly between groups. In the present study, the self-judgments showed similar configural effects across the relative importance groups.

Effects of Omitted Cues

An important new finding of the present study is that how a person responds when a cue is omitted depends on the importance of the cue. Although cue importance has been shown to influence the size of the effect of omitted cues, our findings are different. For the majority of the sample, a high importance cue had a larger effect when less important cues were omitted than when they were presented. In contrast, low importance cues actually had a larger impact when the high importance cue was presented than when it was omitted. These findings were especially marked in the perspective-taking judgments.

Past researchers have hypothesized that when cues are missing people sometimes infer values for those cues based on the given information. Unless constrained in some way, the IV models can predict almost any pattern of slopes across missing cues. To constrain the nature of the inferred values, Levin *et al.* (1991) and Jagacinski (1991) had subjects actually judge one cue based on another to determine how values are inferred. Our results would require assuming a different relationship between cues depending on which cue is omitted. Because of this we proposed two explanations: (a) the partial IV model, in which inferences are made only for the most important cue when it is omitted; and (b) the LW averaging model in which the weights of low importance cues are reduced in absence of the most important cue.

These two ways of accounting for the results have slightly different implications for application to health care decision making by agents. According to the partial IV model, people assume that if they are not given an important cue that the important missing cue has the opposite implications of the information that is available. In the LW averaging model, the agent reduces the weights of the given cues when the most important cue is missing. Johnson (1989) pointed out that IV models may have implications for information search. A health care agent operating from LW averaging might be more likely to seek information about a missing important cue than an agent operating from a partial IV model. The IV models, in whatever form, imply a willingness to infer cue values. When a cue value is inferred, even if only weakly from the given cues, information search might be impeded. Levin, Chapman, and Johnson (1988) concluded that acceptance of one's own inferred values may be one source of overconfidence in one's judgment.

Our extension of the models to information search is admittedly speculative, but has obvious practical importance for health care professionals and their patients. Some patients desire and seek additional information about treatments whereas others do not. Some health care professionals readily provide rich information about treatments (including potential side effects) whereas others do not. Research shows individual differences in information search in laboratory tasks (Payne, Bettman & Johnson, 1993). Perhaps individuals differ in search strategies partly because they make different assumptions about missing cues. These ideas could be tested in future research in order to differentiate the LW averaging and partial IV models we have proposed.

REFERENCES

Amdur, M. A. (1979). Medication compliance in outpatient psychiatry. *Comprehensive Psychiatry,* 20, 339–346.

Anderson, N. H. (1982). *Methods of information integration theory.* New York: Academic Press.

Anderson, N. H., & Zalinski, J. (1991). Functional measurement approach to self-estimation in multiattribute evaluation. In N. H. Anderson (Ed.), *Contributions to information integration theory, volume I: Cognition* (pp. 145–185). Hillsdale, NJ: Erlbaum.

Balzer, W. K., Doherty, M. E., O'Connor, R. (1989). Effects of cognitive feedback on performance. *Psychological Bulletin,* 106, 410–433.

Becker, M. H. (1979). Understanding patient compliance: The contribution of attitudes and other psychosocial factors. In S. J. Cohen (Ed.), *New directions in patient compliance* (pp. 1–31). Lexington, MA: Lexington.

Becker, M. H. (1985). Patient adherence to prescribed therapies. *Medical Care,* 23, 539–555.

Birnbaum, M. H., & Stegner, S. E. (1979). Source credibility in social judgment: Bias, expertise and the judge's point of view. *Journal of Personality and Social Psychology,* 37, 48–74.

Birnbaum, M. H., & Stegner, S. E. (1981). Measuring the importance of cues in judgments for individuals: Subjective theories of IQ, heredity, and environment. *Journal of Experimental Social Psychology,* 17, 159–182.

Birnbaum, M. H., Wong, R., & Wong, L. K. (1976). Combining information from sources that vary in credibility. *Memory & Cognition,* 4, 330–336.

Bjorkman, M. (1972). Feedforward and feedback as determiners of knowledge and policy: Notes on a neglected issue. *Scandinavian Journal of Psychology,* 13, 152–158.

Blackwell, B. (1976). Treatment adherence. *British Journal of Psychiatry,* 129, 513–531.

Dixon, J. A., & Moore, C. F. (1990). The development of perspective-taking: Understanding differences in information and weighting. *Child Development,* 61, 1502–1513.

Eraker, S. A., Kirscht, J. P., & Becker, M. H. (1984). Understanding and improving patient compliance. *Annals of Internal Medicine,* 100, 258–268.

Ericcson, K. A., & Simon, H. A. (1980). Verbal reports as data. *Psychological Review,* 87, 215–251.

Gerber, K. E., & Nehemkis, A. M. (Eds.). (1986). *Compliance: The dilemma of the chronically ill.* New York: Springer.

Goldstein, W. M., & Beattie, J. (1991). Judgments of relative importance in decision making: The importance of interpretation and the interpretation of importance. In D. R. Brown & J. E. K. Smith (Eds.), *Frontiers of mathematical psychology: Essays in honor of Clyde Coombs.* New York: Springer-Verlag.

Goldstein, W. M., Beattie, J., & Barlas, S. (1993). *Subjective importance judgments: Interpretation as a function of preference-response mode.* Poster presented at the Annual Meeting of the Society for Judgment and Decision Making, Washington, DC.

Goldstein, W. M., & Mitzel, H. C. (1992). The relative importance of relative importance: Inferring other people's preferences from relative importance ratings and previous decisions. *Organizational Behavior and Human Decision Processes,* 51, 382–415.

Hammond, K. R., & Brehmer, B. (1973). Quasi-rationality and distrust: Implications for international conflict. In L. Rappaport & D. Summers (Eds.), *Human judgment and social interaction* (pp. 338–391). New York: Holt, Rinehart & Winston.

Haynes, R. B., Taylor, D. W., & Sackett, D. L. (Eds.). (1979). *Compliance in health care.* Baltimore: Johns Hopkins Univ. Press.

Hogarth, R. M., & Kunreuther, H. (1995). Decision making under ignorance: Arguing with yourself. *Journal of Risk and Uncertainty,* 10, 15–36.

Jagacinski, C. M. (1991). Personnel decision making: The impact of missing information. *Journal of Applied Psychology,* 76, 19–30.

Jagacinski, C. M. (1994). Evaluation of job candidates with missing information: Effects of attribute importance and interattribute correlation. *Journal of Behavioral Decision Making,* 7, 25–42.

Johnson, R. D. (1989). Making decisions with incomplete information: The first complete test of the inference model. In T. Srull (Ed.), *Advances in consumer research, vol. 16* (pp. 522–528). Provo, UT: Association for Consumer Research.

Johnson, R. D., & Levin, I. P. (1985). More than meets the eye: The effect of missing information on purchase evaluations. *Journal of Consumer Research,* 12, 169–177.

Kelley, H. H. (1972). *Causal schemata and the attribution process.* Morristown, NJ: General Learning Press.

Kruskal, J., & Carmone, F. (1969). MONANOVA: A Fortran-IV program for monotone analysis of variance. *Behavioral Science,* 14, 165–166.

Kruskal, J. B., & Wish, M. (1978). *Multidimensional scaling.* Beverly Hills, CA: Sage.

Levin, I. P. (1985). How changes in price and salary affect economic satisfaction: Information integration models and inference processes. *Journal of Economic Psychology,* 6, 143–155.

Levin, I. P., Chapman, D. P., & Johnson, R. D. (1988). Confidence in judgments based on incomplete information: An investigation using both hypothetical and real gambles. *Journal of Behavioral Decision Making,* 1, 29–41.

Levin, I. P., & Johnson, R. D. (1982). *Information integration in price-quality tradeoffs: Effects of missing information.* Paper presented at the annual meeting of the Psychonomic Society, Minneapolis, MN.

Levin, I. P., Johnson, R. D., & Chapman, D. P. (1991). Individual differences in dealing with incomplete information: Judging clinical competence. *Bulletin of the Psychonomic Society,* 29, 451–454.

Levin, I. P., Johnson, R. D., & Faraone, S. V. (1984). Information integration in price-quality tradeoffs: The effect of missing information. *Memory & Cognition,* 12, 96–102.

Lund, V. E., & Frank, D. I. (1991). Helping the medicine go down: Nurses' and patients' perceptions about medication compliance. *Journal of Psychosocial Nursing,* 29(7), 6–9.

Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review,* 84, 231–259.

Oden, G. C., & Anderson, N. H. (1971). Differential weighting in integration theory. *Journal of Experimental Psychology,* 89, 152–161.

Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). *The adaptive decision maker.* New York: Cambridge.

Raymark, P. H., Balzer, M. K., Doherty, M. E., Warren, K., Meeske, J., Tape, T. G., & Wigton, R. S. (1995). Advance directives: A policy capturing approach. *Medical Decision Making,* 15, 217–226.

Reilly, B. A., & Doherty, M. E. (1989). A note on the assessment of self-insight in judgment research. *Organizational Behavior and Human Decision Processes,* 44, 123–131.

Reilly, B. A., & Doherty, M. E. (1992). The assessment of self-insight in judgment policies. *Organizational Behavior and Human Decision Processes,* 53, 285–309.

Rosenstock, I. M., & Kirscht, J. P. (1979). Why people seek health care. In G. Stone, F. Cohen, & N. Adler (Eds.), *Health psychology* (Chapter 7). San Francisco: Jossey-Bass.

Rothert, M. L. (1982). Physicians' and patients' judgments of compliance with a hypertensive regimen. *Medical Decision Making,* 2, 179–195.

Rothert, M. L., & Talarcyzk, G. J. (1987). Patient compliance and

the decision-making processes of clinicians and patients. *The Journal of Compliance in Health Care,* 2, 55–71.

Sackett, D. L., Haynes, R. B., & Tugwell, P. (1985). *Clinical epidemiology: A basic science for clinical epidemiology.* Boston: Little, Brown.

Shanteau, J. (1992). Competence in experts: The role of task characteristics. *Organizational Behavior and Human Decision Processes,* 53, 252–266.

Siegel, S., & Castellan, N. J., Jr. (1988). *Nonparametric statistics for the behavioral sciences* (2d ed.). New York: McGraw–Hill.

Slovic, P., & Lichtenstein, S. (1971). Comparison of Bayesian and regression approaches to the study of information processing in judgment. *Organizational Behavior and Human Decision Processes,* 6, 649–744.

Steinmann, D. O. (1974). Transfer of lens model training. *Organizational Behavior and Human Performance,* 12, 1–16.

Surber, C. F. (1984). Inferences of ability and effort: Evidence for two different processes. *Journal of Personality and Social Psychology,* 46, 249–268.

Surber, C. F. (1985). Measuring the importance of information in judgment: Individual differences in weighting ability and effort. *Organizational Behavior and Human Decision Processes,* 35, 156–178.

Viet, C. T., Rose, B. J., & Ware, J. E. (1982). Effects of physical and mental health on health-state preferences. *Medical Care,* 20, 386–401.

Wills, C. E. (1995). *Decision making context, self-reports, and patterns of information use in medication acceptance.* Unpublished doctoral dissertation, University of Wisconsin, Madison, WI.

Wills, C. E., & Moore, C. F. (1994). Judgment processes for medication acceptance: Self-reports and configural information use. *Medical Decision Making,* 14, 137–145.

Wills, C. E., & Moore, C. F. (1995). *Relationships between "think aloud" verbalizations and judgment processes for partially described information.* Poster presented at the annual meeting of the Society for Judgment and Decision Making, Los Angeles, CA.

Yamagishi, T., & Hill, C. T. (1981). Adding versus averaging models revisited: A test of a path-analytic integration model. *Journal of Personality and Social Psychology,* 41, 13–25.

Yamagishi, T., & Hill, C. T. (1983). Initial impression versus missing information as explanations of the set-size effect. *Journal of Personality and Social Psychology,* 44, 942–951.

Received: January 24, 1994