Journal of Behavioral Decision Making, Vol. 7, 193–211 (1994)

Inconsistency and Uncertainty in Multi-attribute Judgment of Human Performance

YOAV GANZACH
The Hebrew University of Jerusalem, Israel

ABSTRACT

This paper examines the effect of uncertainty and inconsistency on the judgment of human performance. The results indicate that the effect of inconsistency on judgment is not mediated by subjective uncertainty. We find that both the level and the extremity of judgment decrease with uncertainty. These effects are explained, respectively, by uncertainty aversion and by regressiveness. We also find that both the level and the extremity of judgment of human performance increase with inconsistency. These effects are explained by reliance on integration rules in which judgment is based primarily on some aspects of the information, while other aspects are, to some extent, ignored.

KEY WORDS Multi-attribute judgment Subjective uncertainty Inconsistency

Most studies of multi-attribute judgment policies concentrated on how people integrate information which is assumed to be accurate. However, quite often multi-attribute judgment is based on information whose perceived accuracy is low, and in particular, on information of low perceived validity or low perceived reliability. Low perceived validity is associated with subjective uncertainty about the degree by which the available attribute values reflect true values. For example, one may be uncertain about the accuracy of a psychological evaluation of the abilities of a job candidate. Low perceived reliability is frequently associated with inconsistency in the information. For example, the perceived reliability associated with two psychological evaluations may be low if the inconsistency — the gap between the evaluations — is high.

In this paper we contrast the effects of inconsistency and subjective uncertainty on multi-attribute judgments of human performance. We examine two hypotheses about the influence of inconsistency on judgment. The first hypothesis is that inconsistency influences judgment through its impact on the subjective uncertainty of the input information, the higher the inconsistency, the higher the subjective uncertainty (e.g. Slovic, 1966; Kahneman and Tversky, 1973). The second hypothesis is that inconsistency influences judgment by inducing integration rules in which judgment is based primarily on some aspects of the information, while other aspects are, to some extent, ignored (e.g. Wyer, 1970). We study these two alternative explanations for the impact of inconsistency on judgment of human performance by examining the concurrent effect of inconsistency and uncertainty on two features of the judgment output: the *level of the judgment* — how positive/negative is the mean judgment — and its *extremity* — the extent to which judgments deviate from the mean judgment.

CCC 0894–3257/94/030193–19

Received 4 May 1993
Accepted 2 February 1994

THE LEVEL OF JUDGMENT

Consider an overall evaluation of two job candidates on the basis of two 'equally important' test scores. The two candidates have the same mean, but while one has two moderate scores, the other has one high score and one low one. There may be three prototypical patterns for the evaluation of the two candidates. In the first pattern, the 'inconsistent' candidate receives a higher score; in the second he or she receives a lower score; and in the third, the evaluations of the two candidates are about the same.

The literature on decision making suggests two possible explanations for these three patterns. According to one explanation, which will be labeled *the inconsistency–uncertainty explanation*, the impact of inconsistency is mediated by the subjective uncertainty associated with inconsistency. (For theoretical approaches for the relationship between inconsistency and subjective uncertainty see Kahneman and Tversky, 1973, and Kahn and Meyer, 1991. The former approach is based on the relationship between inconsistency, representativeness, and uncertainty, the latter on the existence of uncertainty in attribute weights.) According to this explanation, the first pattern described above is the result of a positive attitude towards uncertainty, the second the result of a negative attitude towards uncertainty, and the third is the result of a neutral attitude towards uncertainty.

The other explanation relates these three patterns to the integration rules used by subjects. The third pattern is consistent with reliance on linear-compensatory strategy, a strategy in which judgment depends solely on the weighted average of attribute values, where weights reflect subjective importance. The first and second patterns are consistent with reliance on nonlinear-noncompensatory rules. In particular, the first pattern is consistent with reliance on a disjunctive strategy, a strategy in which judgments depend primarily on one or few high attributes, and the second pattern is consistent with reliance on a conjunctive strategy, a strategy in which judgments depend primarily on one or few low attributes.

These two explanations are neutral in regard to the actual relationship between subjective uncertainty and the level of judgment and the actual relationship between inconsistency and the level of judgment. However, comparing these relationships may allow one to choose between the two alternative explanations. Therefore, in the next two subsections, we review previous research concerning the relationship between subjective uncertainty and the level of judgment and previous research concerning the relationship between inconsistency and the level of judgment. Finally, in the third subsection, we describe an experiment that may distinguish between the two explanations for the effect of inconsistency on the level of judgment.

Subjective uncertainty and the level of judgment

The relationship between subjective uncertainty and the level of judgment of target people, has not, to the best of our knowledge, been researched directly. However, there are studies that investigated the influence of variables associated with subjective uncertainty. The results of this research is conflicting. Some findings suggest that this relationship is negative. After reviewing the literature on positivity and negativity in social judgment, Markus and Zajonc (1985) argue that positivity exists when uncertainty is high, while negativity exists when uncertainty is low (p. 186). Recently, Ganzach and Krantz (1991) showed that a decrease in predictor validity is associated with an increase in expectation about human performance (prediction of GPA). They explain this by a 'leniency heuristic', which is associated with a tendency to 'give the benefit of the doubt' when judging or predicting the performance of fellow human beings. (See also Guilford, 1954; Kahneman and Tversky, 1973.)

However, other findings suggest that the relationship between subjective uncertainty and the level of judgment of target people may be negative. First, research in decision making generally indicates that uncertainty is aversive (Lee, 1971; Becker and Brownson, 1964; Yates and Zukowski, 1976). Second, there are some findings in judgment research indicating a negative relationship between uncertainty and the level of judgment. Most of this research was done in the context of the influence of missing information on judgment (e.g. Yates *et al.*, 1978; Levin *et al.*, 1985; Jaccard and Wood, 1988; Jagacinski, 1991). As an example, Yates *et al.* (1978) found that missing information leads to devaluation of judgment of university courses, and argues that the uncertainty associated with the missing information is the cause of this effect. It should be noted, however, that only one of these studies examined the influence of missing information on judgment of human performance (Jagacinski, 1991). The objects of judgment in the rest of the studies were inanimate. (The distinction between human and inanimate objects is emphasized, since there is evidence suggesting differences in the processes underlying judgments of these two entities: see Ganzach, 1993a; Sears, 1983.)

One possible explanation for the conflicting results of this past research is that uncertainty was not manipulated directly but was invoked as an explanatory variable for the effects of variables such as missing information. In the current work we manipulate uncertainty directly, by informing subjects explicitly how uncertain they should be about the accuracy of the information; that is, by informing them about the validity of the information. Below we will use the term 'uncertainty' solely for this direct manipulation of subjective uncertainty.

Inconsistency and the level of judgment

Research about the relationship between inconsistency and the level of judgment has also produced conflicting results. A number of studies showed that the level of judgment decreases with inconsistency. In most of these studies the judged objects were inanimate (e.g. Einhorn, 1971, 1972; Ogilvie and Schmitt, 1979; Meyer, 1987), but in at least two studies the judged objects were human (Einhorn *et al.*, 1972; Brannick and Brannick, 1989). Recently, however, two studies documented a positive relationship between inconsistency and judgment of human performance. Skowronski and Carlston (1987) showed that a positive relationship between inconsistency and judgment occurs in ability judgment (but not in morality judgment), and Ganzach (1993a) stated that this effect occurs in low involvement ability judgment of college students by their peers.

Testing the alternative theoretical models for the relationship between inconsistency and the level of judgment

Consider an experiment in which a judge has to evaluate various multi-attribute profiles of job candidates. While the information in the various profiles is similar (all candidates are described by the same attributes), the judge is informed that the profiles differ in the (un)certainty that should be assigned to the information. Thus, in this experiment, inconsistency and uncertainty vary simultaneously.

There are various possible results for such an experiment. These may indicate any of the following: that uncertainty has no effect on judgment, that the relationship between uncertainty and the level of judgment is positive, or that this relationship is negative. Similarly, the results of such an experiment may indicate that the relationship between inconsistency and the level of judgment is positive, negative, or that inconsistency has no effect on the level of judgment. Of the nine possible sets of results, two are of special interest to this paper: the results indicating that uncertainty is related negatively to the level of judgment while inconsistency is related positively to the level of judgment, and the results indicating that uncertainty is related positively to the level of judgment while inconsistency is related negatively to this level. Such results would indicate that the effect of inconsistency on judgment is not mediated by subjective uncertainty.

In summary, we are interested in three questions concerning the relationship between uncertainty, inconsistency, and the level of judgment of human performance. First, whether the relationship between uncertainty and the level of judgment is positive or negative; second, whether the relationship between inconsistency and the level of judgment is positive or negative; and third, whether these two relationships are similar or different. The third question is particularly interesting, since it concerns the psychological process that mediates the relationship between inconsistency and level of judgment.

THE EXTREMITY OF JUDGMENT

So far, the discussion about the relationship of inconsistency, uncertainty, and judgment was concerned only with the mean judgment. However, inconsistency and uncertainty may influence not only the level of judgment but also its extremity. If they do indeed influence extremity, their overall effect on judgment will depend on the level of the input information (i.e. whether this information is generally positive or negative). For example, consider the case in which uncertainty has a negative effect on both the level of judgment and on its extremity (i.e. both decrease with uncertainty), and assume that uncertainty is varied at both high and low levels of the input information. The effect of uncertainty on *extremity* implies that an increase in uncertainty will lead to a decrease in judgment in high levels and to an increase in judgment in low levels. However, due to the effect of uncertainty on the *level* of judgment, the decrease at the high level is likely to be greater than the increase at the low level (and if the effect of uncertainty on extremity is 'stronger' than its effect on the level of judgment, it is even possible that an overall positive relationship between uncertainty and judgment will be observed at the low level). Statistically, this pattern of relationships between uncertainty and judgment should lead to both main effects and interactions. Exhibit 1 illustrates the two effects of uncertainty. (See also Ganzach and Krantz, 1991, Figure 1, for a similar analysis of the effect of predictor validity on prediction.)

Subjective uncertainty and the extremity of judgment

Normatively, judgment should be *regressive*: judges should decrease the extremity of their judgments when uncertainty in the input information increases. Do they indeed do so in judgment of human performance?

While intuitive regressiveness was studied extensively in the context of prediction (e.g. Kahneman and Tversky, 1973; Fischhoff *et al.*, 1979; Nisbett *et al.*, 1981; Ganzach, 1993b), there is less research on intuitive regressiveness in judgment (but see Zalesny, 1990[1]). Furthermore, even in the context of prediction, intuitive regressiveness was studied only for uni-variate tasks (i.e. prediction based on one predictor). Since judgment is usually based on multi-variate information, the findings from prediction research may not be applicable to many judgment contexts. This paper examines whether intuitive regressiveness exists in the context of multi-variate (i.e. multi-attribute) tasks.

Inconsistency and the extremity of judgment

Two predictions may be offered regarding the relationship between inconsistency and the extremity of judgment. First, if people are indeed appropriately sensitive to the influence of uncertainty on

[1] Zalensny found that confidence in judgment varies with judgment extremity for novices but did not find this effect for experts. Her study, however, is not directly relevant to the regressiveness issue because (1) it is not clear what is the cause and what is the effect and (2) she used a between-subject design, while the demonstration of regressiveness requires a within-subject design (i.e. each subject should make judgments associated with different degrees of certainty).

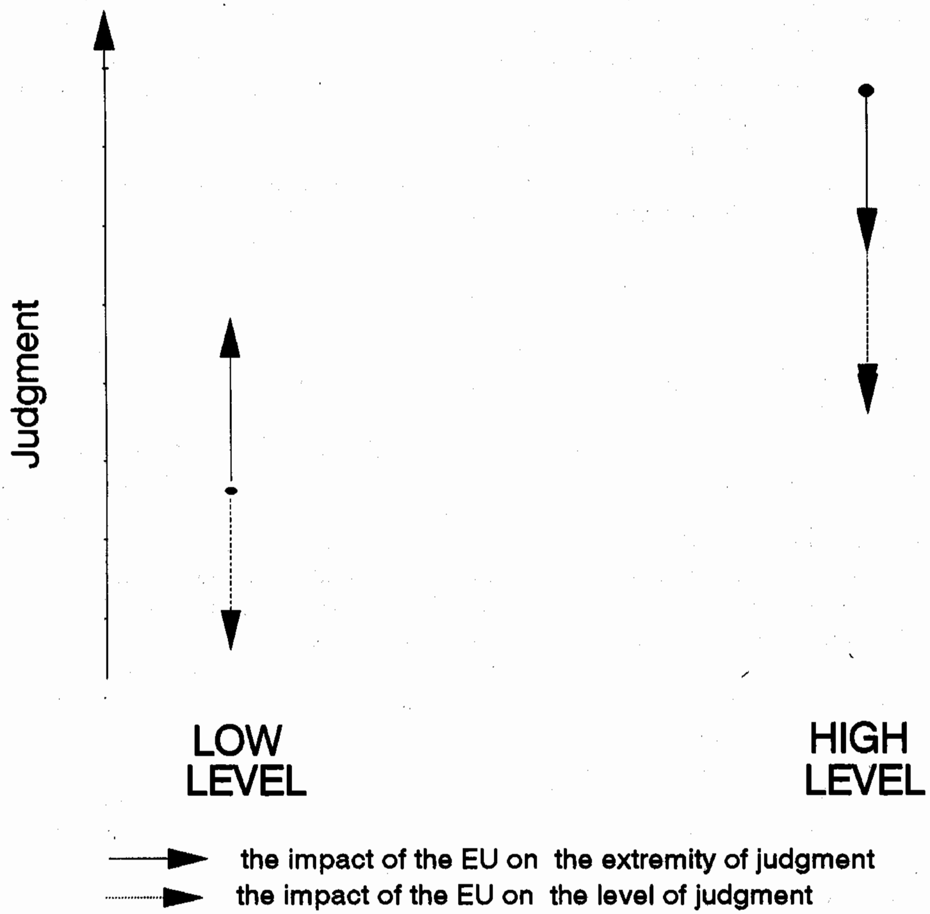

Exhibit 1. The impact of increase in *UN* on the extremity of judgment and on the level of judgment for the case in which *UN* is negatively associated both with the level of judgment and its extremity

judgment, and if, according to the inconsistency–uncertainty model, subjective uncertainty mediates the influence of inconsistency on extremity, then an increase (decrease) in inconsistency should result in a decrease (increase) in the extremity of judgment.

Another prediction regarding the relationship between inconsistency and judgment is offered by a model that will be labelled 'inconsistency resolution'. According to this model, people attempt to resolve inconsistency between two aspects of the input information by relying on other aspects of this information. For example, Ganzach (in 1993a) showed that when subjects have two contradictory recommendations regarding a job candidate, the more positive recommendation receives a higher (lower) weight if the first impression of the candidate is positive (negative). (See also Wyer, 1970; Lynch and Offir, 1989.)

To understand the implication of the inconsistency resolution model to the relationship between inconsistency and judgment, consider the following two pairs of job candidates judged on the basis of two 'equally important' test scores. One pair consists of two candidates with similar, and *high*, mean scores, but different in the discrepancy between the two scores. The other consists of two candidates with similar, and *low*, mean scores, also differing in the discrepancy of these scores. The inconsistency resolution model suggests that in the first pair, the candidate with the higher discrepancy will receive a higher judgment (if the resolution is based on the fact the mean score is high, the higher score receives heavier weight). This model would also suggest that in the second pair, the candidate with the higher discrepancy will receive a lower judgment (if the resolution is based on the fact the mean score is low, the lower evaluation receives heavier weight). Thus, the inconsistency-resolution model suggests that for strong candidates the higher the inconsistency, the higher the judgment, while for weak candidates, the higher the inconsistency, the lower the judgment.

In summary, the inconsistency resolution model and the inconsistency–uncertainty model suggest *opposing* relationships between inconsistency and extremity. While the former suggests a positive relationship between inconsistency and extremity the latter suggests a negative relationship.

EXPERIMENTAL AND MODELING APPROACH

In the following experiment we use a *policy-capturing* experimental paradigm (e.g. Brehmer and Joyce, 1988). In this paradigm, subjects are presented with profiles consisting of a number of informational cues, each cue representing a value on a certain attribute relevant to the judgment. Subjects are then required to make judgments of each of the profiles on the basis of these cues. To demonstrate our modeling approach, consider the case in which each profile includes two scores, each associated with one of two attributes, and a level of (un)certainty associated with the information. Each subject's judgments are analyzed by a model that includes: (1) the main effects of attribute values; (2) the main effect of uncertainty; (3) the main effect of inconsistency, where inconsistency is operationalized by the absolute deviation between the two attributes' scores (the higher the deviation, the higher the inconsistency); and (4) all the two-way interactions, except the interaction between the two attributes (this interaction is omitted since it is highly correlated with inconsistency).

One difficulty in the interpretation of the results of such a model is that when there are strong interactions, the relationship between the dependent variable and each of the independent variables changes as a function of the values of the other independent variables. To overcome this difficulty, it is helpful to center the independent variables at their means. When these variables are centered, the value of each main effect coefficient represents the 'typical' relationship between the dependent variable and the appropriate independent variable, i.e. it represents the slope of this dependent variable when all other variables are at their means (Cohen and Cohen, 1983, p. 325; Cronbach, 1987; Jaccard *et al.*, 1990). Similarly, under this transformation, an interaction coefficient represents the typical influence of the level of one independent variable on the slope of another independent variable.[2]

The model described above allows, after the independent variables are centered, the examination of the concurrent influence of inconsistency and uncertainty on the level of judgment. A significantly positive (negative) coefficient for inconsistency would support the hypothesis that inconsistency is positively (negatively) associated with judgment, and a significantly positive (negative) coefficient for uncertainty would support the hypothesis that uncertainty is positively (negatively) associated with judgment.

The model also allows for examining the influence of uncertainty and inconsistency on the extremity of judgment. A positive interaction between uncertainty and an attribute implies that the higher the uncertainty, the more extreme the judgment. Similarly, a positive interaction between inconsistency and an attribute implies that the higher the inconsistency, the more extreme the judgment.

[2] An additional advantage of this transformation is that it facilitates the detection of interaction between variables since it decreases multi-collinearity between the variables and the product terms.

EXPERIMENT 1

Method

Subjects

Fifty-seven undergraduate Business Administration students taking an Introduction to Psychology course participated in the experiment to fulfil a class requirement. They participated in the experiment in groups numbering three to six. Most of the subjects were first-year students, ranging in age from 20 to 22, and about evenly divided between male and female.

Procedure

Subjects received written instructions in which they were asked to assume that they are sales managers in a food company, responsible for selecting sales people. They were asked to base their judgments on interviews that the candidates had with psychologists. The psychologists summarized the results of these interviews by giving each candidate two scores: (1) A score in 'Logical Communication' which allegedly reflects the candidate's ability to persuade by bringing up logical arguments and presenting them appropriately, and (2) a score in 'Emotional Communication' which allegedly reflects the candidate's ability to persuade by being responsive to the feelings, needs, etc. of the person with whom he or she communicates. Subjects were also told that their certainty in the profiles' information varies, since they know that the diagnostic ability of the psychologists differ.

After reading the instructions, each subject received a booklet containing 60 profiles. Each profile included three pieces of information: the scores of the two attributes and a certainty level. The scores were drawn randomly and independently from a uniform distribution over the range of 50 to 100. Certainty was described on a four-point verbal scale (very high, high, moderate, and low), and was orthogonal to both attributes. Judgments were made on a nine-point scale anchored as 'very high' versus 'very low'. The order of the profiles was reversed for half of the subjects.

Results and discussion

The judgments of each subject were modeled by the following regression model:

$$Y = a + \beta_1 L + \beta_2 E + \beta_3 I + \beta_4 UN + \beta_5 UN \times L + \beta_6 UN \times E + \beta_7 UN \times I + \beta_8 E \times I + \beta_9 L \times I \qquad (1)$$

where E and L are the scores of Emotional Communication and Logical Communication, respectively; UN is the uncertainty associated with the input information, defined so that the lower the perceived validity of the input information, the higher the uncertainty; and I is a measure for inconsistency, defined as $ABS(L-E)$. Prior to the analysis, the independent variables were centered at their means.

The mean regression coefficient (over the 57 subjects) and their standard errors (calculated on the basis of the 57 individual coefficients) for each term in equation (1) are presented in Exhibit 2 (the mean R^2 was 0.79 and its standard deviation 0.08). The first thing that is apparent from these results is that while uncertainty is negatively related to the level of judgment, inconsistency is positively related to the level of judgment. Both effects are highly significant ($t = 13.0$,[3] $p < 0.0001$; $t = 3.1$, $p < 0.003$, respectively). The results are, therefore, not consistent with the inconsistency–uncertainty model. On the other hand, they are consistent with the notion that the relationship between inconsistency and judgment is due to reliance on disjunctive judgment strategies.

The main effects of uncertainty and inconsistency should be interpreted in view of the significant

[3] All the t-values reported for Experiment 1 have 56 degrees of freedom.

Exhibit 2. Mean regression coefficients for experiment 1

Term	Mean	Standard error
Intercept	5.96[a]	0.11
L	0.042[a]	0.0033
E	0.053[a]	0.0033
I	0.0049[c]	0.0016
UN	−0.54[a]	0.042
$UN \times L$	−0.015[a]	0.0020
$UN \times E$	−0.010[a]	0.0020
$UN \times I$	−0.0043[b]	0.0013
$E \times I$	−0.00033[c]	0.00013
$I \times I$	0.00064[a]	0.00016

[a] $p < 0.0001$.
[b] $p < 0.001$.
[c] $p < 0.01$.

interactions that appear in Exhibit 2.[4] Most interesting is the clear pattern of negative interaction between attribute value and uncertainty ($t = 7.4, p < 0.0001$; $t = 5.2, p < 0.0001$ for Logical Communication and for Emotional Communication, respectively). This pattern suggests that, in regard to uncertainty, judgment is regressive: subjects react to an increase in uncertainty by reducing the extremity of their judgments.

In order to gain a better understanding of the interactions presented in Exhibit 2, we performed an additional analysis. For each subject, we estimated the following model for each of the four levels of uncertainty:

$$Y = a + \beta_1 L + \beta_2 E + \beta_3 I + \beta_4 E \times I + \beta_5 L \times I \tag{2}$$

Exhibit 3 presents the average regression coefficients by uncertainty level. The results of this table indicate again that, in regard to uncertainty, judgment is regressive, since there is a clear decrease both in the slope of E and in the slope of L when uncertainty increases. It is also clear from these results that the finding that the coefficient of I is positive (Exhibit 2) holds for all four levels of uncertainty (although for the high and very high levels it is not significant). This implies that the statement that the 'typical' judgment strategy in this task is disjunctive is true for each of the four uncertainty levels.[5]

The results presented in Exhibit 3 also reveal a positive interaction between L and I, indicating that the impact of inconsistency on judgment depends on the value of L. When L is high ($L > 0$ after centering) the higher the inconsistency, the higher the judgment, while when L is low ($L < 0$), the higher the inconsistency, the lower the judgment. (This can be easily seen by noting that the coefficient of L in equation (2) is given by $\beta_1 + \beta_5 I$, where β_1 and β_5 are both positive.[6]) This finding is congruent with the prediction of the inconsistency resolution model described above, since it suggests

[4] Note, however, that by substituting various values of the independent variables in equation (2) it can be shown that the negative relationship between UN and judgment level holds for all the range of each of the other independent variables. The relationship between inconsistency and judgment is true for most — but not all — of the range of the other independent variables.

[5] The data also indicate that disjunctivity decreases with increase in UN (the effect is statistically reliable, since the interaction $UN \times I$ in equation (1) is significant, $p < 0.001$). One way to view this last result is that it represents regressiveness in regard to the strategy used. While there is a general tendency to rely on a disjunctive strategy, this tendency decreases when uncertainty increases.

[6] Another way to explain this effect is that if E is kept constant and L is varied at its extremes, there is an accelerated change in judgment in comparison to the change associated with varying L at a moderate value. This happens because when L is extreme, in addition to the impact of varying L, there is also a shift in weight from E to L.

Exhibit 3. Mean regression coefficients by confidence level

	UN			
Term	Low	Moderate	High	Very high
Intercept	6.67[a]	6.46[a]	5.71[a]	5.07[a]
	(0.11)	(0.11)	(0.12)	(0.16)
L	0.0749[a]	0.0533[a]	0.0404[a]	0.0240[a]
	(0.0053)	(0.0056)	(0.0036)	(0.0051)
E	0.0814[a]	0.0657[a]	0.0421[a]	0.0355[a]
	(0.0056)	(0.0048)	(0.0041)	(0.0049)
I	0.0151[b]	0.0073[d]	0.0022	0.0037
	(0.0045)	(0.0035)	(0.0046)	(0.0028)
$E \times I$	0.00005	−0.00091[d]	−0.00024	−0.00018
	(0.00035)	(0.00038)	(0.00043)	(0.00021)
$L \times I$	0.00385[a]	0.00122[c]	0.00018	0.00082[c]
	(0.00067)	(0.00049)	(0.00032)	(0.00028)

Note: Numbers in parentheses are standard errors.
[a] $p < 0.0001$.
[b] $p < 0.001$.
[c] $p < 0.01$.
[d] $p < 0.05$.

that inconsistency is resolved on the basis of L. However, the results do not reveal a clear effect in regard to the interaction between E and I.[7] Thus, in this experiment, there is only a weak support for the inconsistency resolution model. But the next experiment provides stronger support for this model.

Exhibits 4 and 5 show the effects of uncertainty and inconsistency on the level and extremity of judgment. Exhibit 4 illustrates the effects of uncertainty, keeping E and I constant at their mean value. The predictions of equation (1) are plotted for low, moderate, and high values of L (since the range of L is 50, these values are, after centering, -25, 0, and $+25$, respectively), separately for the lowest and the highest uncertainty level. These predictions were obtained by substituting the average regression coefficients from Exhibit 2 and the mean values of E and I (which are equal to zero after centering) in equation (1). The exhibit shows the effect of uncertainty on both the level of judgment and the extremity of judgment. The former effect is demonstrated by the fact that the line of low uncertainty is systematically above the line of high uncertainty. The latter effect is demonstrated by the fact that the slope of the low-uncertainty curve is steeper than the slope of the high-uncertainty one.

Exhibit 5 illustrates the effect of inconsistency, keeping E and uncertainty constant at their mean value. The predictions of equation (1) are plotted for the low, moderate, and high values of L, separately for the lowest and the highest inconsistency level.[8] These predictions were obtained by substituting the average regression coefficients from Exhibit 2, and the mean values of E and uncertainty (which are equal to zero after centering) in equation (1). The exhibit demonstrates the effect of inconsistency on both the level of judgment and the extremity of judgment. The former effect is demonstrated by the fact that for a 'typical' value of L (i.e. the mean L) judgment is higher for high inconsistency than for low inconsistency. The latter effect is demonstrated by the fact that the slope of the high-inconsistency curve is steeper than the slope of the low-inconsistency one.

---

[7] There is even a tendency for a negative interaction between E and I. This tendency is explained by an averaging process (see footnote 10).

[8] These inconsistencies are -15 and $+35$, respectively. The reason is that the mean I is about 15, and that before centering, the minimum gap between the two attributes is 0 and the maximum gap is 50.

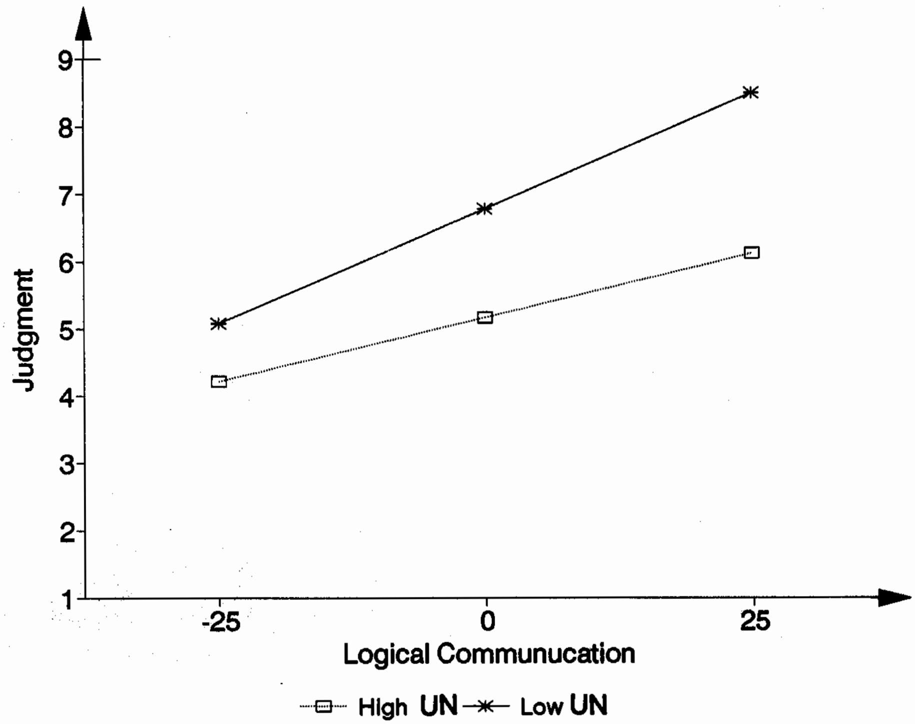

Exhibit 4. The relationship between Logical Communication and judgment for the low and the very high levels of overall *UN*. All other variables are constant at their means

Together, the two exhibits suggest that the effect of inconsistency cannot be explained by subjective uncertainty. They show that the effects of inconsistency are the reverse of the effects of uncertainty, in regard to both the level of and the extremity of judgment. The effects of uncertainty are compatible with negative attitude towards uncertainty and with 'intuitive regressiveness' (Ganzach and Krantz, 1991), while the effects of inconsistency are compatible with reliance on disjunctive strategy accompanied by inconsistency resolution.

EXPERIMENT 2

In the first experiment the effect of *overall-uncertainty*, the uncertainty associated with all the input information, was compared with the effect of *inter-attribute inconsistency*, the inconsistency between scores obtained for different attributes. Experiment 2 compares the effect of *attribute-uncertainty*, the uncertainty associated with each individual attribute, with the effect of *intra-attribute inconsistency*, the inconsistency between scores obtained from different measurement on the same attribute. Attribute-uncertainty is manipulated by varying the perceived validity of each of the attributes and intra-attribute inconsistency is manipulated by varying the perceived inter-rater reliability of the attributes. The effects of these two variables on judgment are compared in a between-subjects design. In one condition, *the validity condition*, we examine the effect of attribute-uncertainty on judgment, while in the other, *the reliability condition*, we examine the effect of intra-attribute inconsistency on judgment.

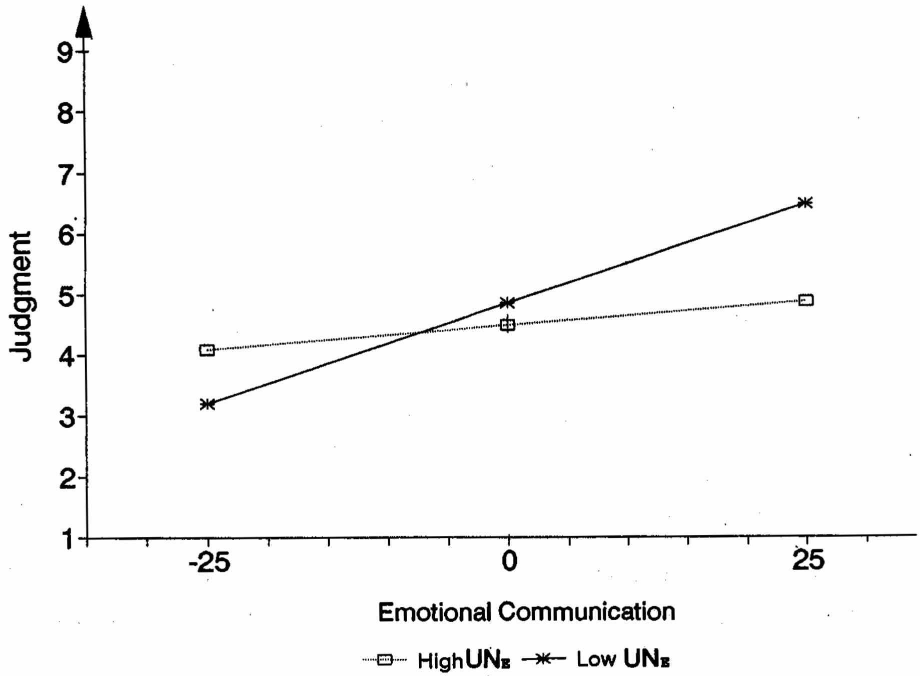

Exhibit 5. The relationship between Logical Communication and judgment for the low and high levels of inconsistency. All other variables are constant at their means

One advantage of this design is that both the inconsistency–uncertainty model and the inconsistency–resolution model suggest that intra-attribute inconsistency is likely to have a stronger effect than inter-attribute inconsistency in regard to deviations from a linear compensatory strategy. Two discrepant scores on the same attribute are likely to create more uncertainty (according to the inconsistency–uncertainty model) or a greater tendency to resolve the inconsistency (according to the inconsistency–resolution model) than two discrepant scores on two different attributes, since subjective inconsistency is likely to be higher when it is associated with intra-attribute inconsistency than with inter-attribute inconsistency. Thus, whatever the effect of inconsistency, it is likely to be stronger for intra-attribute inconsistency than for inter-attribute inconsistency. Furthermore, in the case of inter-attribute inconsistency, there is an asymmetry in the scores that give rise to inconsistency (i.e. these are scores on two different attributes). As a result, the effects of inconsistency in the first experiment may have been associated also with the specific attributes that were used in the stimuli (e.g. an intuitive theory suggesting that in evaluating sales people, inconsistency should be resolved by Logical Communication and not by Emotional Communication). In this experiment, there is a symmetry in the two scores that give rise to inconsistency.

Another advantage of the design is that while in Experiment 1 the uncertainty and the inconsistency associated with the two attributes were equal by design, in this experiment they are specific to each attribute. This allows for a more precise examination of the theoretical models, as different predictions are offered regarding the interaction between an attribute and the uncertainty (inconsistency) associated with it than regarding the interaction between the attribute and the uncertainty (inconsistency) associated with the other attribute.

Method

Subjects

Seventy-one undergraduate Business Administration students taking an Introduction to Psychology course participated in the experiment to fulfil a class requirement. They participated in the experiment in groups of three to six. They were randomly assigned to each of the two conditions.

Procedure

The experiment was similar to Experiment 1 in the cover story, and in the attributes on which judgment was made. It was also similar to Experiment 1 in the number of profiles (60) each subject judged and in the judgment scale. It differed from Experiment 1 in that attribute-uncertainty and intra-attribute inconsistency, rather than overall-uncertainty and inter-attribute inconsistency, were manipulated.

Attribute-uncertainty was manipulated in the validity condition by introducing into each profile two scores representing the psychologist's (un)certainty about each of the two attribute values he assigned to the candidate. Intra-attribute inconsistency was manipulated in the reliability condition by supplying two scores for each attribute, representing two measurements of the same attribute. The two scores were presented as the result of two interviews conducted by two psychologists with each of the candidates. The discrepancy between the two scores was explained as the result of inaccuracy in the psychologist's evaluations.

Stimulus

Each profile in the reliability condition was generated by randomly selecting a mean value for L and a mean value for E from a uniform distribution over the range of 30–70. For each attribute, we generated two scores on the basis of the mean value, first by randomly selecting an intra-attribute range (discrepancy) from a uniform distribution over the range of 1–30 and then by adding (subtracting) half this range to (from) the mean value to create the higher (lower) score. (Odd half-ranges were rounded upwards.)

For the purpose of comparability between the validity condition and the reliability condition, the profiles in the former condition corresponded to the profiles in the latter in two ways. First, attribute values were equal to the mean attribute values in the corresponding profile of the reliability condition. Second, attribute's uncertainty were derived from the intra-attribute's discrepancies of the corresponding profile in the reliability condition. Intra-attribute discrepancies between 1 and 10 were transformed to low uncertainty, intra-attribute discrepancies between 11 and 20 to moderate uncertainty, and intra-attribute discrepancies between 21 and 30 to high uncertainty.

An example for the output of this process is a profile in the reliability condition whose L scores were 47 and 75 and E scores 31 and 45. The corresponding profile in the validity condition had an L value of 61, an E value of 38, a high level of uncertainty associated with the L score, and a moderate level of uncertainty associated with the E score.

Results and discussion

The validity condition

The judgments of each subject were modeled by the following regression model:

$$Y = a + \beta_1 L + \beta_2 E + \beta_3 I + \beta_4 UN_L + \beta_5 UN_E + \beta_6 UN_E \times E + \beta_7 UN_L \times L + \beta_8 UN_E \times L + \beta_9 UN_L \times E + \beta_{10} UN_E \times I + \beta_{11} UN_L \times I + \beta_{12} E \times I + \beta_{13} L \times I \quad (3)$$

where UN_L and UN_E are the levels of uncertainty in Logical Communication and Emotional Communi-

Exhibit 6. Mean regression coefficients for experiment 2

Validity condition			Reliability condition		
Term	Mean	Standard error	Term	Mean	Standard error
Intercept	4.68[a]	0.84	Intercept	5.08[a]	0.12
L	0.047[a]	0.0038	L	0.050[a]	0.0050
E	0.041[a]	0.0045	E	0.035[a]	0.0054
I	0.0078[c]	0.0024	I	0.0032	0.0028
UN_L	−0.17[b]	0.043	$I_{,L}$	0.034	0.030
UN_E	−0.16[a]	0.034	I_E	0.050	0.031
$UN_E \times E$	−0.025[a]	0.0031	$I_E \times E$	0.0070[c]	0.0023
$UN_L \times L$	−0.023[a]	0.0027	$I_L \times L$	0.0051[d]	0.0023
$UN_E \times L$	0.0079[a]	0.001	$I_E \times L$	0.00020	0.0024
$UN_L \times E$	0.0049[d]	0.0019	$I_L \times E$	−0.0040	0.0024
$UN_L \times I$	−0.0039	0.0023	$I_E \times I$	−0.0046	0.0034
$UN_L \times I$	−0.0067[c]	0.0022	$I_L \times I$	−0.0013	0.0044
$E \times I$	0.00053	0.00028	$E \times I$	0.00038	0.00035
$L \times I$	−0.00023	0.00025	$L \times I$	−0.00042	0.00043

[a] $p < 0.0001$.
[b] $p < 0.001$.
[c] $p < 0.01$.
[d] $p < 0.05$.

cation, respectively, and the rest of the symbols are as above. Prior to the analysis, UN_L and UN_E were transformed into a numerical scale in which 1, 0, and −1 corresponded to high, moderate, and low uncertainty, respectively. The independent variables were centered prior to the analysis.

The mean regression coefficients of equation (3) (over the 36 subjects who participated in this condition) and their standard errors are presented on the left-hand side of Exhibit 6 for each term of the equation (the mean R^2 was 0.74 and its standard deviation 0.13). The results are in line with those of Experiment 1. First, the main effects of attribute uncertainty in this condition are similar to the main effect of overall uncertainty in Experiment 1; the higher the attribute uncertainty, the lower the judgment ($t = 4.6$,[9] $p < 0.0001$ and $t = 3.9$, $p < 0.0005$ for UN_E and UN_L, respectively). Second, the main effects of inter-attribute inconsistency is similar to those of Experiment 1: in both experiments the higher the inter-attribute inconsistency, the higher the judgment (in the current experiment the coefficient of I is significantly positive, $t = 3.2$, $p < 0.003$). Thus, the results of this condition, as the results of Experiment 1, are in line with the notion that it is not subjective uncertainty that mediates the relationship between inter-attribute inconsistency and judgment, since attribute uncertainty is negatively related to the level of judgment while inter-attribute inconsistency is positively related to the level of judgment.

As in Experiment 1, these main effects should be understood in view of the two significant interactions between attribute value and (same) attribute uncertainty. Again, these interactions are consistent with the notion that judgments are regressive (both the $UN_E \times E$ and $UN_L \times L$ coefficients are significantly negative $t = 9.9$, $p < 0.0001$ and $t = 8.3$, $p < 0.0001$). Thus, the pattern that was found for

[9] All the t-values reported for the validity condition of Experiment 2 have 35 degrees of freedom.

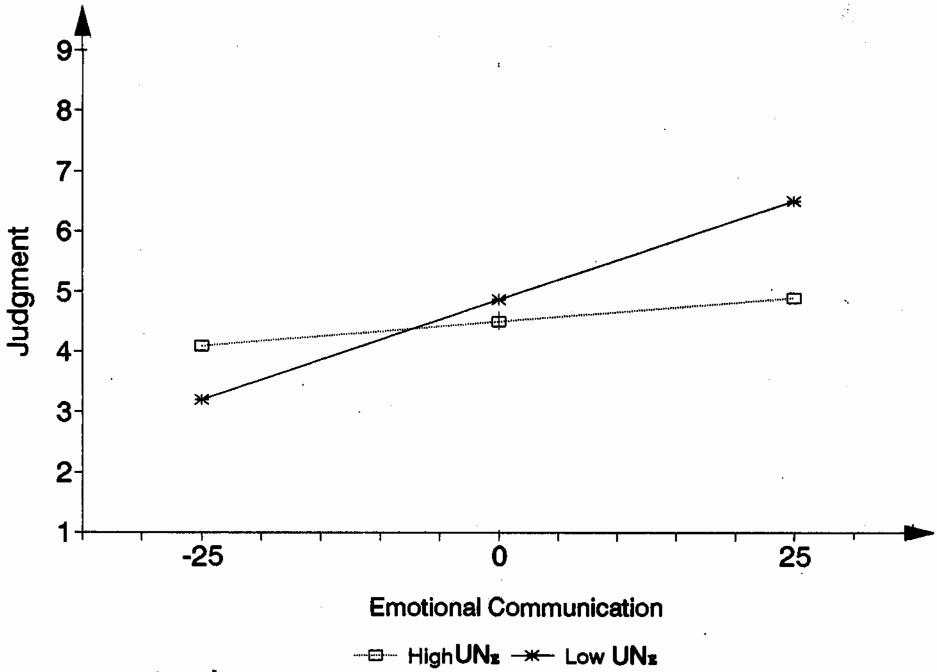

Exhibit 7. The relationship between Emotional Communication and judgment for low and high levels of UN_E. All other variables are constant at their means.

overall uncertainty in the first experiment is also found for each of the two attribute uncertainties in the current experiment, in regard to both the level of judgment and the extremity of judgment.[10]

Exhibit 7 demonstrates the effect of attribute-uncertainty on judgment in regard to UN_E (the pattern for UN_L, is very similar). The predictions of equation (3) are plotted as a function of E, keeping L, UN_L, and I constant at their mean value, separately for the lowest and the highest level of UN_E. The exhibit demonstrates the effect of UN_E on the level of judgment (for the mean value of E, judgment is higher when UN_E is low than when it is high) and on its extremity (the slope is steeper when UN_E is low). Note that the interaction between attribute-value and UN_E is, unlike the interaction between attribute-value and overall-uncertainty (Exhibit 4), a cross-over interaction. Apparently, when compared to overall uncertainty, the effect of attribute uncertainty on the level of judgment is weaker relative to its effect on extremity.

The reliability condition

In order to make the results of this condition comparable to the results of the validity condition, intra-attribute discrepancy was transformed to a three-level inconsistency scale. Intra-attribute discre-

---

[10] Exhibit 6 also indicates that the interactions between each attribute UN and the value of the other attribute were also significant ($p < 0.0001$ for the $UN_L \times L$ interaction and $p < 0.02$ for the $UN_L \times E$ interaction). Unlike the coefficient of $UN_E \times E$ and $UN_L \times L$, the coefficients of these interactions are positive. (Note that the former interactions are considerably stronger than the latter. This can be seen by comparing the absolute values of the appropriate coefficients.) This is due to the operation of an averaging process whereby when the weight of one attribute increases, the weight of the other decreases. Thus, since increase in $UN_E(UN_L)$ increases the weight of $E(L)$ it decreases the weight of $L(E)$. One additional effect in Exhibit 7 that is worth mentioning is the positive interaction between I and E ($p < 0.06$). This interaction is consistent with inconsistency resolution.

pancies between 1 and 10 were transformed to -1, intra-attribute discrepancies between 11 and 20 to 0, and intra-attribute discrepancies between 21 and 30 to $+1$.

If the influence of inconsistency on judgment is mediated by subjective uncertainty, the effect of intra-attribute inconsistency should be similar to that of attribute-uncertainty. However, if either a disjunctive strategy or inconsistency resolution is operating, different results should be obtained. In the former case the main effects for intra-attribute inconsistency should be observed, while in the latter an interaction between intra-attribute inconsistency and (same) attribute mean-value should be expected.

The analysis was performed by the following model:

$$Y = a + \beta_1 L + \beta_2 E + \beta_3 I + \beta_4 I_L + \beta_5 I_E + \beta_6 I_E \times E + \beta_7 I_L \times L + \beta_8 I_E \times L + \beta_9 I_L \times E + \beta_{10} I_E \times I + \beta_{11} I_L \times I + \beta_{12} E \times I + \beta_{13} L \times I \quad (4)$$

where I_L and I_E are the intra-attribute inconsistencies of Logical Communication and Emotional Communication, respectively, and the rest of the symbols are as above.

The results are presented on the right-hand side of Exhibit 6 (the mean R^2 was 0.64 and its standard deviation 0.21). These results support the inconsistency resolution model, since the interaction between attribute mean-value and attribute inconsistency is positive ($t = 2.2$,[11] $p < 0.03$ and $t = 3.1$, $p < 0.005$ for the $I_L \times L$ and $I_E \times E$, respectively). The positive interactions stand in sharp contrast to the negative interactions between uncertainty and attribute value in the validity condition. These positive interactions imply that the higher the inconsistency, the higher the attribute's weight. This is contrary to what would be expected if the effect of inconsistency on the extremity of judgment was similar to the effect of uncertainty, i.e. it is contrary to the inconsistency-uncertainty model. However, the results support the inconsistency resolution model, since they imply that intra-attribute inconsistency render judgment more positive when attributes' values are high, and more negative when attributes' values are low.[12]

Exhibit 8 demonstrates the effects of attribute-inconsistency on judgment in regard to I_E (the pattern for I_L is very similar). The predictions of equation (3) are plotted as a function of E, keeping L, I_L, and I constant at their mean value, separately for the lowest and the highest level of I_E. By comparison with Exhibit 7, it is clear that while judgments are more extreme when I_E is high than when it is low (the slope is steeper when I_E is high), they are *less* extreme when UN_E is high than when it is low.

Finally, in this condition, unlike the validity condition (and unlike Experiment 1), inter-attribute inconsistency did not play a major role in judgment, and, in particular, it did not affect the level of judgment. Neither the main effect of inter-attribute inconsistency nor the interactions involving this variable were significant. Most likely, the introduction of intra-attribute inconsistency leads to decreased attention to inter-attribute inconsistency, and therefore to a reduction in its effect on judgment.

GENERAL DISCUSSION

The experiments presented here suggest that the influence of uncertainty and inconsistency on judgment of human performance is quite different. Uncertainty is negatively related to both the level and

[11] All the t-values reported for the reliability condition of Experiment 2 have 34 degrees of freedom.

[12] The data were also analyzed using continuous measures for I_E and I_L. That is, I_E and I_L were defined as the intra-attribute discrepancies of E and L, respectively. The results were similar to those of the analysis reported in the paper, except a marginally significant tendency for judgment to become more positive with increase in inter-attribute inconsistency.

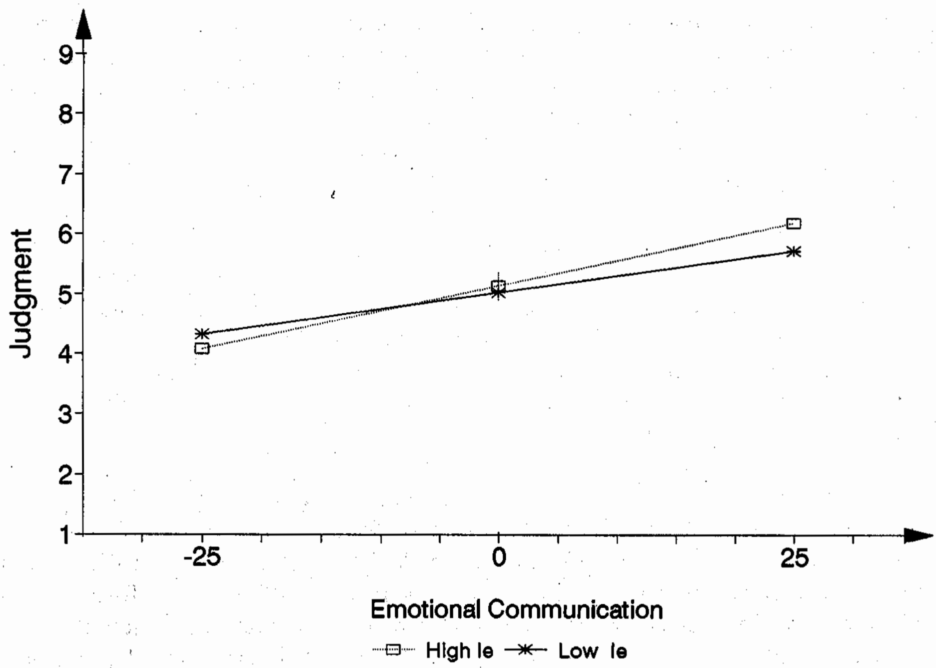

Exhibit 8. The relationship between Emotional Communication and judgment for low and high levels of I_E. All other variables are constant at their means

the extremity of judgment. On the other hand, inconsistency tends to be positively related to both the level of judgment and its extremity.

These effects are clear in regard to uncertainty. They were found when the entire input information had the same level of uncertainty, and when each piece of information had a different level of uncertainty. Thus, in regard to uncertainty, people have a negative attitude towards uncertainty and are appropriately regressive.

One question arising from these findings concerns the source of the difference between these current results and previous ones which had indicated a positive relationship between uncertainty and the level of evaluation of other people (e.g. Markus and Zajonc, 1985; Ganzach and Krantz, 1991). One possible explanation is that the effect of uncertainty on judgment depends heavily on contextual factors such as the context of the judgment (e.g. judgment of performance in a business context versus general evaluation in a social context) or the type of the required judgment output (e.g. predictive judgment versus judgment of success/failure).

The influence of inconsistency on judgment in the two experiments is more complex than that of uncertainty. A somewhat different pattern of results was obtained for inter- and intra-attribute inconsistency. Intra-attribute inconsistency had no effect on the level of judgment, but had a strong positive one on its extremity (the higher the inconsistency, the higher the extremity); inter-attribute inconsistency had a positive effect on the level of judgment, and a tendency to increase the extremity of judgment. (We also found that the effect of inconsistency on both the level of judgment and its extremity disappear when intra-attribute inconsistency is added to the input information.)

These results suggest that the influence of inconsistency on judgment in our experiments cannot be explained by its impact on the subjective uncertainty of the input information. On the other hand, they are explained fairly well by a model suggesting that inconsistency influences judgment of human performance by inducing integration rules in which judgment is based primarily on some aspects of the information, while other aspects are, to some extent, ignored. With regard to inter-attribute inconsistency, judgment is based primarily on the positive aspects of the information, while the negative aspects are ignored. With regard to intra-attribute inconsistency, judgment is based primarily on the higher score of the attribute if the overall level of the attribute (the average of the two scores) is high and on the lower score if the overall level is low.

Why is the effect of inconsistency on judgment dependent on the source of this inconsistency, whether it is inter- or intra-attribute inconsistency? One reason for the difference between the effects of inter- and intra-attribute inconsistency may be that the average of two measurements of the same attribute is perceived to be more relevant to the resolution of intra-attribute inconsistency than is the average of two attributes to that of inter-attribute inconsistency. Furthermore, two discrepant scores cause more subjective inconsistency when they are associated with the same attribute than when they are associated with different ones. As a result, in the former case there is a stronger tendency for inconsistency resolution.

While the effect of intra-attribute inconsistency on judgment of human performance was not investigated in previous research, the effect of inter-attribute inconsistency was. Our results are consistent with some previous research (Ganzach, 1993a; Skowronski and Carlston, 1987) but inconsistent with others (Einhorn *et al.*, 1972; Brannick and Brannick, 1989). One reason for the difference may be the degree of involvement associated with the judgment tasks. While in the former research the level of involvement was low, in the latter it was high (the experimental task attempted to simulate judgments which are rather important for the subjects). Indeed, it was argued (Ganzach, 1993a, a) that since an increase in involvement results in more emphasis on the negative aspects of the information, there is a negative relationship between inconsistency and the level of judgment when involvement is high but not when it is low. For example, a negative relationship between inconsistency and judgment was found when student subjects evaluated fellow students as potential partners to co-operate in an important home assignment but not when they evaluated these fellow students as teaching assistants who are told by the professor to evaluate the students. Thus, it is likely that the current findings concerning the relationship between inconsistency and judgment are limited to low involvement judgment of human performance. Note, however, that these findings are of particular interest for studying the process that mediates the relationship between inconsistency and the level of judgment, since low involvement, but not high involvement, leads to reliance on disjunctive strategies, and therefore to opposite effects of uncertainty and inconsistency on judgment. Conjunctive strategies, on the other hand, lead to similar (i.e. negative) effects of uncertainty and inconsistency on the level of judgment.

Finally, a possible alternative explanation for the relationship between inter-attribute inconsistency and the level of judgment is that the subjective attribute scales are convex (positively accelerated). However, such an explanation is not consistent with the effect of intra-attribute inconsistency in Experiment 2. If the subjective attribute scales are convex then there should have been a main effect for attribute inconsistency for both attributes. But such main effects were not found in the experiment.

Another way by which explanations which are based on nonlinear integration rules can be compared to those based on nonlinearity in the attribute scales is by using process-tracing techniques. Indeed, recent findings obtained in a process-tracing technique (Ganzach, 1993) give further support to the former explanation over the latter. In the study, subjects learned a disjunctive relationship between cues and criterion (in a multiple-cue-probability-learning paradigm) in one part of the experiment and a conjunctive relationship in the other part (for half of the subjects the order was reversed). At the end of the experiment subjects were asked about the strategy they used in each of the two parts. Many suggested reliance on rules which are based on value-dependent weights (i.e. nonlinear integration rules), while none(!) mentioned nonlinearities in the scales as the basis for the strategy used.

ACKNOWLEDGEMENTS

This research was supported by the Davidson and by the Kmart Centers of the Jerusalem School of Business Administration.

REFERENCES

Becker, J. W. and Brownson, F. O. 'What price ambiguity? Or the role of ambiguity in decision making', *Journal of Political Economy*, **72** (1964), 62–73.

Brannick, M. T. and Brannick, J. P. 'Nonlinear and noncompensatory processes in performance evaluation', *Organizational Behavior and Human Decision Processes*, **44** (1989), 97–122.

Brehmer, B. and Joyce, C. R. B. *Human Judgment: The Social Judgment Theory View*, Amsterdam: Elsevier Science Publishers, 1988.

Cohen, J. and Cohen, P. *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*, Hillsdale, NJ: Lawrence Erlbaum, 1983.

Cronbach, L. 'Statistical tests for moderator variables: Flaws in analysis recently proposed', *Psychological Bulletin*, **102** (1987), 414–417.

Einhorn, H. J. 'The use of nonlinear, noncompensatory models in decision making', *Psychological Bulletin*, **73** (1970), 221–230.

Einhorn, H. J. 'Use of nonlinear, noncompensatory models as a function of task and amount of information', *Organizational Behavior and Human Performance*, **6** (1971), 1–27.

Einhorn, H. J. 'Expert measurement and mechanical combination', *Organizational Behavior and Human Performance*, **7** (1972), 86–106.

Einhorn, H. J., Komorita, S. S. and Rosen, B. 'Multidimensional models for the evaluation of political candidates', *Journal of Experimental Social Psychology*, **8** (1972), 58–73.

Fischhoff, B., Slovic, P. and Lichtenstein, S. 'Subjective sensitivity analysis', *Organizational Behavior and Human Performance*, (1979).

Ganzach, Y. 'The natural selection of prediction heuristics', Manuscript submitted for publication, 1993.

Ganzach, Y. 'Goals a determinants of nonlinear noncompensatory judgment strategies: Leniency vs strictness', *Organizational Behavior and Human Decision Processes*, **56** (1993a), 422–440.

Ganzach, Y. 'Predictor representation and prediction strategies', *Organizational Behavior and Human Decision Processes*, **56** (1993b), 190–212.

Ganzach, Y. and Krantz, D. H. 'The psychology of moderate prediction: II. Leniency and uncertainty', *Organizational Behavior and Human Decision Processes*, **48** (1991), 169–192.

Guilford, J. P. *Psychometric Methods*, New York: McGraw-Hill, 1954.

Hitt, M. A. and Bar, S. H. 'Managerial selection decision models: Examination of configural cue processing', *Journal of Applied Psychology*, **53** (1989), 53–61.

Jaccard, J. and Wood, G. 'The effects of incomplete information on the formation of attitudes toward behavioral alternatives', *Journal of Personality and Social Psychology*, **54** (1988), 580–591.

Jaccard, J., Wan, C. K. and Turrisi, R. 'The detection and interpretation of interaction effects between continuous variables in multiple regression', *Multivariate Behavioral Research*, **25** (1990), 467–478.

Johnson, R. D. and Levin, I. P. (1985). 'More than meet the eye: the effect of missing information on purchase evaluation'. *Journal of Consumer Research*, **12**,169–177.

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

Kahn, B. E. and Meyer, R. J. 'Consumer multiattribute judgment under attribute-weight uncertainty', *Journal of Consumer Research*, **17** (1991), 508–521.

Kahneman, D. and Tversky, A. 'On the psychology of prediction', *Psychological Review*, **80** (1973), 237–251.

Lee, W. *Decision Theory and Human Behavior*, New York: Wiley, 1971.

Levin, I. P., Johnson, R. D., Russo, C. P. and Deldin, P. J. 'Framing effects in judgment tasks with varying amounts of information', *Organizational Behavior and Human Decision Processes*, **36** (1985), 362–397.

Lynch, J. G. and Offir, C. 'Effects of cue consistency and value on base-rate utilization', *Journal of Personality and Social Psychology*, **56** (1989), 170–181.

Maltin, M. and Stang, D. *The Pollyanna Principle: Selectivity of language, memory and thought*, Cambridge MA: Schenkman.

Markus, H. and Zajonc, R. B. 'The cognitive perspective in social psychology', in Aronson, E. and Lindzey, G. (eds), *The Handbook of Social Psychology*, New York: Random House, 1985.

Meyer, R. J. 'The learning of multi-attribute judgment policies', *Journal of Consumer Research*, **14** (1987), 155–173.

Nisbett, R. E., Zukier, H. and Lemley. 'The dilution effect: Nondiagnostic information weakens the effect of diagnostic information', *Cognitive Psychology*, **13** (1981), 248–277.

Ogilvie, J. R. and Schmitt, N. 'Situational Influences of linear and nonlinear use of information', *Organizational Behavior and Human Performance*, **23** (1979), 292–306.

Sears, O. S. 'The person positivity bias', *Journal of Personality and Social Psychology*, **44** (1983), 233–250.

Skowronski, J. J. and Carlston, D. E. 'Social judgment and social memory: The role of cue diagnosticity in negativity, positivity and extremity biases', *Journal of Personality and Social Psychology*, **52** (1987), 689–699.

Slovic, P. 'Cue consistency and cue utilization in judgment', *American Journal of Psychology*, **79** (1966), 427–434.

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

Stewart, T. R. 'Judgment analysis: Procedures', in Bernd, B. and Joyce, C. R. B. (eds), *Human Judgment: The social judgment theory view*, Amsterdam: Elsevier Science Publishers.

Wyer, R. S. 'Information redundancy, inconsistency and novelty and their role in impression formation', *Journal of Experimental Social Psychology*, **6** (1970), 111–127.

Yates, J. F., Jagacinski, C. M. and Faber, M. D. 'Evaluations of partially described multiattribute options', *Organizational Behavior and Human Decision Processes*, **21** (1978), 240–251.

Yates, J. F. and Zukowski, L. G. 'Characterization of ambiguity in decision making', *Behavioral Science*, **21** (1976), 19–25.

Zalesny, M. D. 'Rater confidence and social influences in performance appraisals', *Journal of Applied Psychology*, **75** (1990), 274–289.

Author's biography:

Yoav Ganzach received his Ph.D. from Columbia University in 1988. He is an Assistant Professor at the School of Business Administration at the Hebrew University of Jerusalem.

Author's address:

Yoav Ganzach, School of Business Administration, The Hebrew University of Jerusalem, Jerusalem, 91905, Israel.