Integration of intention and outcome in moral judgment

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This experiment studied how the intention of an actor affected moral judgment. Subjects received information about the intention of an actor, and about the value of the outcome of his action to a recipient. They judged how grateful the recipient should feel. Both stories and simple assertions were used as stimuli, and both gave similar results. The main data followed the parallelism prediction, evidence for the operation of some simple integration model. Auxiliary data provided a critical test that eliminated the adding rule and supported the averaging rule. These results suggest that previous work on the cognitive algebra of human judgment may generalize to the moral realm. These results also illustrate how information integration theory can provide a significant advance upon phenomenonological approaches to moral judgment such as have been used by Heider and Piaget.

Moral judgments pervade daily life. Judgments of fairness, of deservingness, of obligation and gratitude are but a few of the many moral feelings that arise continuously in social interaction. However, little is known about the nature of such judgments or how they depend on the stimulus factors in the given situation.

Two major systematic discussions of these problems have been given by Heider (1958) and by Piaget (e.g., 1932), both of whom emphasize the concept of intention. In Heider's phenomenonological approach, intention is central to personal causality, and thus to the common sense understanding of the social world. Piaget's concern is with the developmental shift from the younger child's focus on the objective outcome of an action to the older child's concern for the subjective causes of that action.

However, Heider's naive phenomenology has failed to produce much experimental analysis (e.g., Zajonc, 1968, p. 353), perhaps as a consequence of his theoretical base in a static, equilibrium balance theory rather than in a causal, stimulus-response orientation (Heider, 1958, p. 207; see also Anderson, 1971, p. 188). Also, the work following Piaget has been largely bound up in his taxonomy for a developmental stage theory rather than with a detailed study of causal stimuli and their joint action.

The present paper proceeds from the assumption that moral judgments arise from the same kinds of cognitive processes that underlie nonmoral judgments, such as have been studied in psychophysics and decision-making,

for example. The work in these latter areas has obtained considerable evidence that the stimulus cues that go into any judgment are integrated according to simple algebraic rules (Anderson, 1974a). Hopefully, these results will generalize to the moral realm, and a few studies have been performed with some success (see Anderson, 1974b, Section III C). Most of these studies, however, have been restricted to a good-bad type of judgment, or to integration of cues that have similar quality or dimension.

The particular moral quality studied in this report is gratitude. The *intention* of an agent was varied as well as the *value* of his action to a recipient. Subjects judged how grateful the recipient would feel toward the agent. Theoretical interest centered on the rule by which subjects integrate the two cues of intent and value to reach their judgment.

An important and somewhat novel theoretical aspect of this task is that intention and value appear to be qualitatively different cues. That argues against any adding-type rule and raises the possibility of a multiplying rule. A multiplying rule is also suggested by the consideration that the recipient should not feel grateful if the action was unintentional or accidental. The value of the action would influence the recipient's pleasure, of course, but it does not seem that he would feel grateful toward an effectively impersonal force. Mathematically, these considerations argue for a multiplying rule in which intention acts as a moderator or amplifier of value. In particular, zero intention would imply zero gratitude.

However, there is one apparent objection to a simple multiplying rule. If the agent had good intentions, then the recipient would presumably feel some gratitude even when the action had zero value. That rules out a simple product rule in which zero value would nullify the best intentions.

These intuitive arguments are useful for sizing up the problem, and that can play an important role in experimental design. However, such arguments do not constitute serious evidence. It is possible, for example, that intention has two effects, one additive, the other multiplicative. And it is possible that no simple integration rule holds at all. Phenomenonological analysis is unable to pursue these questions past the first simple speculations. Fortunately, they can be put to direct experimental test by applying functional measurement methodology, as will be shown below.

Two previous experimental reports bear on this issue. Graesser and Anderson (1974) found that generosity, which can be considered as a form of intention, acted as a multiplier, at least in the main judgment condition. However, the judgment task was of expected gift size, which is not a moral quality, and so this result may not generalize to the present case. More immediately relevant is the report of Tesser, Gatewood, and Driver (1968) who varied intention and value, as well as the cost to the agent, in a three-way factorial design and found support for a linear integration rule. In their experiment, however, intention was not a simple variable, since it compounded both altruistic and selfish components. Moreover, their experiment may have lacked power to detect a multiplicative component since it was conducted on a between-subject basis as part of a regular class section.

The present experiment was designed to obtain further information on the integration model for intention and value. A preliminary experiment, not reported here, used stories as stimuli and obtained support for a linear integration rule. This design was extended to include a test between the adding and averaging rules. A second condition was added, in which the informational cues were given as simple assertions, rather than as stories. Simple assertions are more flexible experimentally, and it was hoped to validate their use by showing that they yielded the same results as the stories.

METHOD

Subjects received brief descriptions of some action that contained information about the intention of the agent and the value of the action to the recipient. They were told to judge how grateful the average person would feel in such circumstances. Two types of descriptions were used, paragraph stories and simple assertions.

One story, based on a theme of "Jane helps Dave," will serve to illustrate the content and style.

"David had to complete a biology project by Friday. Among the many things he had to finish was a 10-page typed report for the project. Jane said she would be glad to help him by typing the 10-page report. She decided to help him because she really wanted to do something nice for him. With Jane's help he was able to spend more time on the posters for his project. This allowed him to present a better prepared project, but it did not help his overall grade. He still got his C."

The first three sentences of this story set the theme and were constant for all 12 stories in this theme set. The next sentence

defines the level of intention (high in this example), whereas the last two sentences define the level of value (medium in this example). The complete design was a 3 by 4 factorial, with 3 levels of intention and 3 levels of value plus a fourth level in which the value was not specified. This design was replicated with a second theme in which Mike helped John catch up with his late work.

In the second part of the experiment, the cues were simple assertions: Person A wanted (very much, moderately, slightly) to help Person B. The outcome was (very, moderately, slightly) valuable to B. Each of these cues was given alone and also combined in a 3 by 3 design.

Responses were made on a 20-cm graphic rating bar. End-anchor stimuli were given during the instructions to define the ends of the rating bar ("not at all grateful" and "extremely grateful").

Each subject judged the 12 stories of each theme set and then the 15 cases of simple assertions. The order of the two themes was randomized across subjects. Stimuli were given in separate shuffled order for each subject within each of the three sets of stimuli. The first theme set was given twice, the first replication being considered as practice. The practice for the remaining two sets of stimuli included the appropriate end-anchors and the three combinations from the main diagonal of the 3 by 3 design.

Twenty students at UCSD served as paid subjects. Each was tested individually in a session that lasted about ½h.

RESULTS

Simple Assertions

The data for the simple assertions are shown in the two panels of Figure 1. The three solid lines in each panel are different views of the same data from the main Intention by Value design; these data are plotted with a different horizontal axis in the two panels in order to facilitate comparison with the two respective single-cue curves which are indicated by the dashed lines.

Two features of these data are important. The first is that the three solid curves appear to be approximately parallel. This visual observation is supported by the statistical analysis in which the Intention by Value interaction was not significant [$F(4/76) = 1.37$, $MS_e = 1.65$].

Parallelism is important theoretically because it suggests the operation of some simple integration rule. However, there are two simple rules that can account for parallelism. One is the linear, additive rule that has been favored by many investigators. The other is the averaging
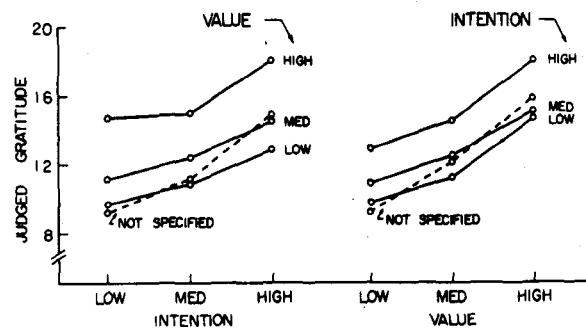

Figure 1. Judged gratitude as a function of Intention and Value of outcome. Data from simple assertions.

rule that has been developed in information integration theory (Anderson, 1974a).

A critical test between the adding and averaging rules is provided by the single-cue data represented by the dashed line in each panel of Figure 1. This single-cue curve is not parallel to the other three curves, but instead exhibits a crossover interaction. That this crossover is reliable is shown by the significance of the interaction term in the full 4 by 3 design [$F(6/114) = 4.50$ and 3.13, $MS_e = 1.78$ and 1.85, respectively].

This crossover interaction is the second important feature of these data. The crossover is predicted by the averaging rule, but is sharply contrary to the linear, additive rule. These data, therefore, eliminate the linear model and indicate that value and intention are integrated according to an averaging model.

The logic of this adding-averaging test has been given elsewhere (Anderson, 1974a), but it may be appropriate to summarize it briefly here. Compare the dashed curve with the solid curve for medium intention in the right panel of Figure 1. The dashed line represents the response when the value cue listed on the horizontal axis is given alone. The solid line, according to averaging theory, results from averaging in the medium intention cue with the value cue listed on the horizontal axis. When the value cue is low, at the left end, the medium intention cue raises the average; but when the value cue is high, at the right end, the medium intention cue lowers the average. Thus, there is a crossover of these two curves.

One minor aspect of the data, although not significant, may be noted because of its potential theoretical importance. The response to the low level of each single cue is a little lower than the response to their combination. The simplest explanation is that a simple averaging model holds, and that the small difference is merely statistical fluctuation. However, it is also possible that when only one cue is specified, the subject assumes some working value for the other cue and averages that assumed value in with the single given cue. For the present data, this interpretation would require the assumed cue to have a near-zero value, and a relatively low weight. This interpretation may deserve consideration since it relates to the concept of "initial impression" as well as to the general problem of how subjects deal with missing information.

That the crossover test is indeed critical for linear or additive formulations deserves emphasis in two respects. The crossover obviously eliminates the strict linear or additive model which predicts that all four curves will be parallel. More importantly, it also eliminates an entire class of generalized linear or additive models, such as might be obtained by the incorporation of a law of diminishing returns, for example. Such models would not imply parallelism, but they would require that the curve for the single cue lie entirely on one side or the

other of any double cue curve. By the same reasoning, the crossover eliminates the possibility that the additive model can be saved by any appeal to nonlinearity in the rating response. No monotone transformation can undo a crossover interaction. The strength of this critical test, therefore, lies in the fact that it is qualitative rather than quantitative (Anderson, 1974a, Section 3.2).

Story Design

The stories showed much the same picture as the simple assertions. The data are shown in Figure 2, averaged over the two themes. Two features of these data are important, just as with Figure 1 above.

First, the three solid curves are approximately parallel. There is a small divergence toward the right, as would be predicted by a multiplying model. However, the Intention by Value interaction fell short of significance [$F(4/76) = 2.46$, $MS_e = 2.38$]. Essentially the same pattern of near-parallelism was obtained for both themes since the Intention by Value by Theme interaction was not significant [$F(4/76) = .56$, $MS_e = 2.07$].

Second, the dashed line, which represents the judgment when only the intention cue was given, does not seem to be parallel to the other three curves. That this nonparallelism is reliable is shown by the significance of the interaction in the full 4 by 3 design [$F(6/114) = 5.11$, $MS_e = 2.95$]. This result is contrary to the linear or adding rule. However, it agrees with the averaging rule which implies that the single-cue curve will have a steeper slope than the double-cue curves.

In one respect, the data from the stories are not as strong support for the averaging hypothesis as the data from the simple assertions. Although the single-cue curve in Figure 2 shows a steeper slope, it does not actually cross over any of the solid curves. Presumably, a crossover would have been obtained had a level of the value cue been used that was halfway between the medium and high curves in Figure 2. However, it is not easy to write these stories to fit a close prescription on their scale values.
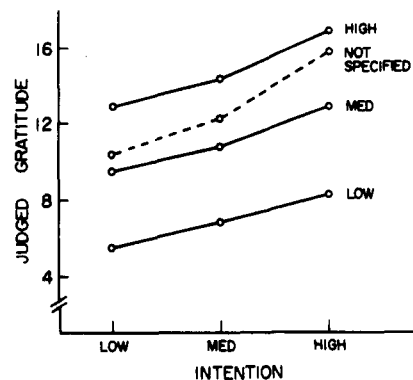

Figure 2. Judged gratitude as a function of Intention and Value of outcome. Data from story themes.

The agreement between the results from the stories and from the simple assertions is important in two ways, one methodological, the other conceptual. Methodologically, the simple assertions have several advantages for experimental design. The main advantage is that the levels of the cues can be varied in an essentially continuous manner since it is only necessary to specify an adverb or a point on a cue scale. Selecting cues to have prescribed values is thus straightforward, whereas writing the stories requires a good deal of trial and error in this respect. In addition, the simple assertions are more flexible experimentally, and they require much less concern about the purity of the information defining each cue, or about compatibility of different cues. One experimental comparison does not go very far, of course, but the present results do support the hope that results obtained with simple verbal stimuli will generalize to more complex verbal stimuli.

Conceptually, the agreement between the stories and the simple assertions is important because it suggests that the complex verbal material is integrated in the same way as the simple assertions. In either case, therefore, each cue is theoretically represented by two stimulus parameters, namely, a scale value and a weight. However, there is evidently a great difference in the valuation process that constructs the parameters for the two kinds of stimuli. With the simple assertions, the dimensional structure of cues is virtually forced on the subject, and the value of each level is prescribed directly by the adverbial quantifier. The stories, however, do not obviously set up a dimensional structure nor do they embody a simple quantification of the cues. Instead, the valuation process rests upon the interpretation of verbal material that is much more complex than the simple assertions. It deserves reflection, therefore, that this valuation process seems to lead to the same two-parameter, weight-scale value representation for the stories as for the simple assertions (see also Anderson, 1974a, Sections 7.1, 8.1, 1974b, Section IV D). If this kind of result is supported in further work, it may show how the methods of information integration theory can be helpful for certain problems in language comprehension.

DISCUSSION

The present evidence for the averaging hypothesis in moral judgment is somewhat unexpected. Although extensive evidence for averaging has been found in previous work, that work has been mainly with stimulus cues of the same informational quality. The two cues used here, namely, the intention of the agent and the value to the recipient, are not obviously similar in nature. Indeed, there was some basis to expect them to be integrated by a multiplying rule as noted in the introduction. Nevertheless, the evidence for the averaging hypothesis is clear. Furthermore, the same pattern of results was obtained with story themes as with very simple assertions.

The present experiment is not the first in which subjects followed an adding-type rule where a multiplying rule could have been expected. Graesser and Anderson (1974) found, as predicted, that subjects multiplied generosity and income cues in their judgments of expected gift size. However, when given the cues of gift size and generosity, which mathematically should also follow a multiplying model, the subjects shifted to an adding-type rule. Parallel results were obtained by Anderson and Butzin (1974). In the somewhat different context of equitable division of job payment, Farkas and Anderson (Note) found that in some cases subjects used adding-type integration rules rather than the ratio rule of equity theory. As these experiments illustrate, judgment often follows simple algebraic models but not always that model that would be expected on rational grounds.

The present averaging result suggests that subjects treat the intention and value cues as informationally equivalent. Why and how that should be so is not clear. A speculative interpretation is based on the idea that judgment of gratitude is mediated by a judgment of deservingness. There is some evidence that judged deservingness may be an average of the motivation and the actions of an agent (Anderson, 1974b, Section III C). Thus, a person who tries hard is considered to be deserving even if he accomplishes nothing. Effort and accomplishment correspond directly, in the present task, to intention of the agent, and the value of his action to the recipient.

This interpretation would also be consistent with the finding by Tesser et al. (1968) that information about the cost of the action to the agent also seemed to follow a linear integration rule. In their experiment, the cost cue would bear on the motivation of the agent, and so be qualitatively similar to the intention cue which is also motivational in nature. Accordingly, the averaging hypothesis should apply to these two cues.

The present theoretical interpretation differs in an important respect from that of Tesser et al. (1968). They argued for a linear model, but the crossover interactions in Figures 1 and 2 above show that a decidedly nonlinear model is required. In particular, the averaging model appears to provide a good account of these data.

It should be emphasized that there is no empirical disagreement between the present results and those of Tesser et al. When each judgment is based on the same number of cues, then the averaging model with equal weighting predicts parallelism. Thus, the parallelism in the two-cue designs of Figures 1 and 2 is entirely consistent with the lack of interactions in the three-cue design used by Tesser et al. Without the auxiliary single-cue conditions, it would have appeared that the integration rule was linear.

This methodological problem, incidentally, has wider relevance. It represents one of the two serious limitations on the recurrent claims that have been made for the prevalence of linear or additive models in human judgment (e.g., Dawes & Corrigan, 1974; Fishbein, 1967; Goldberg, 1968; see also Anderson, 1971, p. 193, 1972; Birnbaum, 1973, 1974). Without suitable design and analysis, true nonlinearity and configurality can escape detection.

Conceptually, the general concern of the present experiment is with the study of moral judgment, especially the role of perceived intent. The present theoretical system contrasts sharply with the phenomenonological approaches of Heider (1958) and Piaget (1932). Their formulations are broad and global, and they are attractive by virtue of their appeal to common sense. Certainly there can be little doubt of the importance of studying the moral judgments that are so pervasive in daily social life. Unfortunately, phenomenological approaches do not get much past pointing to the problem. They seem to be ill-suited as a basis for experimental analysis, and fail to bring their theoretical concepts under empirical scrutiny.

The information-integration approach that underlies the present paper is oriented directly at experimental analysis. One basic question concerns the integration rule by which separate pieces of information are integrated into a unitary judgment. This concern with integration rules leads naturally to concern with experimental specifics such as the kind, number, and interrelations of the given pieces of information, and the nature of the judgment task. Such an approach does not readily lead to broad generalities of the kind found in the phenomenonological approaches, but generalizations arise instead from the gradual accumulation of experimental evidence.

One broad generalization has found sufficient experimental support to be taken seriously, namely, that there is a general cognitive algebra that underlies much of human judgment. Although various exceptions are known, the accumulated evidence shows that simple algebraic rules are widespread in human judgment. This generalization has received extensive support in nonmoral judgment (Anderson, 1974a, 1974b). There is both hope and evidence to expect that much of moral judgment will also obey a general cognitive algebra.

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NOTE

1. The construction of these stories required considerable pilot work. A Xerox copy can be obtained by writing to the second author.