A paired-comparisons paradigm for investigating person perceptions*

IRWIN P. LEVIN,† University of Iowa, Iowa City, Iowa 52240

and

CHARLES F. SCHMIDT, Rutgers University, New Brunswick, N.J. 08903

Ss were presented with a series of pairs of person descriptions. Each person description consisted of one or more personality trait adjectives. Within each pair of person descriptions, S had to choose the person he would most like to have as a friend and indicate how much he preferred that person over the other person in the pair. When a description consisted of several adjectives, it was suggested that Ss integrate the information through a weighted averaging process. Consistent with this notion, a reliable set size effect was obtained with positive-valued adjective sets; however, no reliable set size effect was obtained with negative adjectives. There was no evidence for discounting of inconsistent information when a pair of antonyms was included in the description of a given person.

A paradigm used often in recent years for studying how people form impressions of others involves the presentation of sets of personality trait adjectives, each set describing a different hypothetical person. Typically, S is asked to rate his impression of each person by making a numerical response on some fixed scale following the presentation of the adjective set describing that person. The effects of variables such as information content, set size, and stimulus redundancy are assessed by making the appropriate comparisons between the responses to the various sets.

The present paper describes a paradigm that allows for the study of the previously mentioned variables in a different but equally "naturalistic" setting. Rather than being asked to evaluate each person description separately, Ss are asked to compare pairs of descriptions. Specifically, they are asked to choose one member of each pair as the person they would prefer to have as a friend and indicate how much they prefer that person to the other person in the pair.

The initial study using this paradigm presents experimental comparisons of combinatorial rules of information integration. The first set of comparisons involves a choice between two hypothetical persons, each described by two adjectives, where the component adjectives had been presented singly in an earlier part of the experiment. Assume that a person described by the single adjective A had

been preferred over a person described by the single adjective B by the amount X, and that a person described by the single adjective C had been preferred over a person described by the single adjective D by the amount Y. How will S then respond when he is to choose between one person described by both the adjectives A and C and another person described by both the adjectives B and D? According to a simple sum model, the person described by A + C will be preferred over the person described by B + D by the amount of X + Y. According to a simple average model, the person described by A + C will be preferred by the amount $\frac{1}{2}(X + Y)$. The present experiment allows tests of these and other models of stimulus integration.

Another set of comparisons considers the set size effect. The S is asked to choose between a person described by three homogeneous adjectives and a person described by two homogeneous adjectives of the same value. Anderson (1967), using the typical impression formation paradigm described earlier, found that presenting a larger number of equally polarized adjectives increased the polarization of the impression response over that obtained with a smaller number of adjectives. To account for this effect, Anderson proposed a model in which the impression response was predicted to be a weighted average of the values of each of the adjectives and of S's initial impression. It will be of interest to see if analogous effects are found with the present paired-comparisons paradigm.

The final set of comparisons involves a study of the effects of stimulus inconsistency. Anderson & Jacobson (1965), again applying a weighted average model to the impression formation task, found evidence suggesting that inconsistent information receives less weight, but this effect was of only slight magnitude except

when instructions suggesting resolution of the inconsistency were given. In the present study, as in the Anderson and Jacobson study, inconsistency is introduced by including both halves of an antonym pair within a given person description.

METHOD

The Ss were 27 undergraduate students who volunteered in order to fulfill a course requirement in introductory psychology at the University of Iowa. The Ss were tested in groups of about five each.

Person descriptions were formed by selecting personality trait adjectives from a list of 555 adjectives previously rated on "likableness" by Anderson (1968) using a scale of 0-6. Adjectives were chosen from the following parts of the scale: high-valued (H) adjectives (scale values 5.0-5.5), moderately positive (M⁺) adjectives (scale values 3.5-4.5), moderately negative (M⁻) adjectives (scale values 1.5-2.5), and low-valued (L) adjectives (scale values 0.5-1.0).

Procedure

The person descriptions were presented in a test booklet, with four choices per page in Part I and three choices per page in Part II. In Part I S was told that he would be shown a series of pairs of adjectives, each adjective describing a different hypothetical person and that he would have to choose which person within a given pair he would prefer to have as a friend. He was to do this by circling the appropriate description. He was then told to indicate how much he preferred this person to the other person by writing a number in the space provided next to each pair. He was told that he could use any whole number that he wanted and that he was to let the number represent the amount by which he preferred one person over the other, choosing a low number if his degree of preference was low or a high number if his degree of preference was high. He was told not to place any a priori upper limit on the range of numbers he would use throughout the experiment.¹ Each S was told to proceed through the adjective pairs at his own pace and that he would come to a new set of printed instructions when he reached Part II. The instructions for Part II were essentially the same as those for Part I, except that S was now told that each hypothetical person would be described by more than one adjective, each adjective having been supplied by a different knowledgeable acquaintance of that person, and that he should take into account all of the information when making a choice.

The first 45 choices that S had to make consisted of comparing two hypothetical persons who were each described by one

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†Requests for reprints should be sent to Irwin P. Levin, Department of Psychology, University of Iowa, Iowa City, Iowa 52240.

adjective (Part I). The choices of experimental interest involved the pairing of a person described by an M^+ adjective with a person described by an M^- adjective. There were 30 such pairings, interspersed randomly within the 45 pairings. The remaining 15 pairings did not involve M^+ and M^- adjectives and were for purposes of allowing S to spread his responses over a wide range of values.

The final 53 choices that S had to make consisted of comparing two hypothetical persons who were each described by more than one adjective (Part II). For 15 of these, one person was described by two M^+ adjectives and the other person was described by two M^- adjectives (choice type $M_1^+ + M_2^+ \text{ vs } M_1^- + M_2^-$), where each of the M^+ adjectives had been paired against one of the M^- adjectives in Part I. For another 12 of the choices S had to compare one person described by three homogeneous adjectives with another person described by two equal-valued adjectives; six of these choices involved M^+ adjectives (choice type $M_1^+ + M_2^+ + M_3^+ \text{ vs } M_4^+ + M_5^+$) and six involved M^- adjectives (choice type $M_1^- + M_2^- + M_3^- \text{ vs } M_4^- + M_5^-$). These M^+ and M^- adjectives were different from the ones used in Part I. Another 12 of the choices again used these latter M^+ and M^- adjective sets, except that a pair of antonymic adjectives (HL) was added to the set that previously contained two M^+ or M^- adjectives. This yielded six comparisons of the type $M_1^+ + M_2^+ + M_3^+ \text{ vs } M_4^+ + M_5^+ + \text{HL}$ and six of the type $M_1^- + M_2^- + M_3^- \text{ vs } M_4^- + M_5^- + \text{HL}$. The remaining 14 pairings in Part II involved combinations of H and L adjectives in sets of Size 2, 3, or 4. The order of presentation of the choices in Part II was nonsystematic but had the restriction that two choices involving any of the same adjectives be separated by at least five intervening choices. The positioning of adjectives within a set was random, except that two antonyms always appeared with one immediately beneath the other. The right-left position of the two adjective sets for a given choice was randomized.

RESULTS AND DISCUSSION

There was a great variation in the range of response values used by the different Ss. Some Ss used a range of 10 points or less; others used a range of 1,000 points or more. The relative values assigned to different comparisons also differed between Ss. Consequently, the results were analyzed using statistical tests that did not average numerical values across Ss.

The first set of comparisons involved an analysis of Part II choices of the type $M_1^+ + M_2^+ \text{ vs } M_1^- + M_2^-$ as a function of

the Part I choices $M_1^+ \text{ vs } M_1^-$ and $M_2^+ \text{ vs } M_2^-$. Initially each Part II preference response was compared to both the simple sum and the simple average of the corresponding Part I preference responses. For 22 out of the 27 Ss, the mean preference response to the set $M_1^+ + M_2^+$ over the set $M_1^- + M_2^-$ was between the mean predicted value based on a simple average of the Part I responses and the mean predicted value based on a simple sum. For 11 of these Ss the simple average model made more accurate predictions than the simple sum model, and for the other 11 Ss the reverse was true. Of the remaining five Ss, predictions based on the simple average model were quite accurate for two Ss, predictions based on the simple sum model were quite accurate for two Ss, and for one S the predictions of each model considerably overestimated the responses. Thus, a model which makes predictions intermediate between the predictions of a simple average and a simple sum model would seem to do a better job of describing the data for most of the Ss in this study. Such a model would be one that assumes that the response to a choice between two person descriptions depends upon the difference between the weighted average of the adjective values (and S's initial impression) in each description. In the present case the predicted response to the choice $M_1^+ + M_2^+ \text{ vs } M_1^- + M_2^-$ could be written as follows:

$$R = \frac{W_0 I_0 + W_1 M_1^+ + W_2 M_2^+}{W_0 + W_1 + W_2} - \frac{W_0' I_0 + W_1' M_1^- + W_2' M_2^-}{W_0' + W_1' + W_2'}$$

where $W_1, W_2, W_1',$ and W_2' represent the weights of the adjectives M_1^+, M_2^+, M_1^- , and M_2^- , respectively; I_0 and W_0 (or W_0') represent the value and weight of S's initial impression. For simplicity we may assume that $M_1^+ = M_2^+ = M^+$, $M_1^- = M_2^- = M^-$, $W_0 = W_0'$, and $W_1 = W_2 = W_1' = W_2' = W$. The equation then reduces to $R = 2W(M^+ - M^-)/(W_0 + 2W)$.

Set size effects were investigated by comparing Ss' tendency to choose hypothetical persons described by three like-valued adjectives over persons described by two like-valued adjectives. For choices involving M^+ adjectives, persons described by sets of the type $M_1^+ + M_2^+ + M_3^+$ were chosen over persons described by sets of the type $M_4^+ + M_5^+$ in 67% of the comparisons. The tendency to choose persons described by three M^+ adjectives over persons described by two M^+ adjectives was

statistically significant, $t(26) = 4.92$, $p < .01$, and supports the notion that increasing the number of like-valued adjectives increases the polarity of the impression. This is consistent with the model formulated above, which would predict in this case that when S forms a weighted average of three M^+ adjectives and his initial impression (which is assumed to be lesser in value than M^+), the resulting value will be greater than the value when he averages two M^+ adjectives and his initial impression. An analogous reliable set size effect for M^- adjectives was, however, not obtained. Persons described by three M^- adjectives were chosen slightly, but not significantly, more frequently than persons described by two M^- adjectives. This could be due to inadequacies in using normative scale values to choose M^- adjectives for the present Ss. Further quantitative analyses of set size effects in the present paradigm would be enhanced by preselecting adjectives for each S individually and by varying set size over a wider range.

The effects of adjective inconsistency were investigated by comparing the preference responses to $M_1^+ + M_2^+ + M_3^+ \text{ vs } M_4^+ + M_5^+$ choices with the preference responses to corresponding $M_1^+ + M_2^+ + M_3^+ \text{ vs } M_4^+ + M_5^+ + \text{HL}$ choices and by comparing the preference responses to $M_1^- + M_2^- + M_3^- \text{ vs } M_4^- + M_5^-$ choices to corresponding $M_1^- + M_2^- + M_3^- \text{ vs } M_4^- + M_5^- + \text{HL}$ choices. In the set $M_4^+ + M_5^+ + \text{HL}$, the L adjective is affectively inconsistent with the other adjectives (it is the only negative-valued adjective), and in the set $M_4^- + M_5^- + \text{HL}$, the H adjective is affectively inconsistent with the others (it is the only positive-valued adjective). If the inconsistent adjective tends to be discounted (i.e., weighted less), then the value of the set $M_4^+ + M_5^+ + \text{HL}$ should be greater than the value of the set $M_4^+ + M_5^+$ and the value of the set $M_4^- + M_5^- + \text{HL}$ should be less than the value of the set $M_4^- + M_5^-$. This would lead to the prediction of a greater degree of preference for the set of three M^+ adjectives in $M_1^+ + M_2^+ + M_3^+ \text{ vs } M_4^+ + M_5^+ \text{ choices}$ than in $M_1^+ + M_2^+ + M_3^+ \text{ vs } M_4^+ + M_5^+ + \text{HL}$ choices, and a lesser degree of preference for the set of three M^- adjectives in $M_1^- + M_2^- + M_3^- \text{ vs } M_4^- + M_5^- \text{ choices}$ than in $M_1^- + M_2^- + M_3^- \text{ vs } M_4^- + M_5^- + \text{HL}$ choices. In neither comparison was there a significant difference, $t(26) < 1.00$ in each case. In fact, in each case the small difference that was found was in the opposite direction of that predicted by a discounting notion. Recalling that instructions stressed that S

should take into account all of the information in making his choice, these results suggest that the two halves of an antonym pair tended to cancel each other out in the final evaluation.

In summary, the present paired-comparisons technique for studying person perception appeared to be useful for investigating some variables of interest and models of stimulus integration previously applied in the standard impression formation paradigm. In this initial study there was evidence suggestive of differences between the processes underlying choice and preference responses in the paired-comparison situation and the processes underlying the impression response to cumulative information about a single person. Further refinement and extension of the present procedures and

manipulations are needed in order to afford quantitative tests of the models of interest.

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NOTE

1. A pilot study where Ss were given a fixed (20-point or 100-point) response scale showed that Ss tended to crowd their responses at the upper end of the scale, and this served to attenuate the effects of the variables of interest.

Symbolic and size shifts in short-term memory tasks*

DELBERT A. BRODIE and LOUIS G. LIPPMAN
Western Washington State College, Bellingham, Wash. 98225

Five groups of 30 Ss were tested for recall of triads of spelled-out numbers (SON) or arabic numerals (AN) for four trials in order to examine the effects of a shift in either symbolic presentation or physical size. Recall was facilitated by size and symbolic changes, overall recall of AN was superior to that of SON, and idiosyncratic item effects were observed. The relationship between these results and isolation effects was discussed.

In short-term memory (STM) tasks, stimuli are presented for approximately .5 to 4 sec per stimulus, and Ss are usually tested for retention within 60 sec from the initial stimulus presentation. Two types of STM tasks have been used to investigate the effects of isolation upon retention. In simultaneous STM tasks (e.g., Peterson & Peterson, 1959) the entire intact stimulus is presented, and Ss are tested for recall before additional items are presented. In sequential STM tasks (e.g., Conrad, 1964), however, stimuli are presented successively, and Ss are not tested for retention until after all the stimuli in a particular series have been presented.

Recall decrements across trials in simultaneous STM tasks can be minimized by a shift to semantically dissimilar stimuli

(e.g., Hofer, 1965; Loess, 1967). This finding, which is in keeping with results from sequential STM tasks (Pillsbury & Raush, 1943; Saltz & Newman, 1959) and serial-learning long-term memory (LTM) tasks (Newman & Saltz, 1958), indicates that isolation via semantic class is an effective means of producing enhanced recall.

Until recently, visual isolation appeared to have no effect upon performance in simultaneous STM tasks. Hofer (1965) reported that printing an item in red had no effect on Ss' recall, and Wickens (1968) noted that changes in figure-ground coloration had no clear effect on Ss' performance. These findings were inconsistent with those of Smith (1949), who not only found enhanced recall for an item printed in red in a sequential STM task but also obtained similar effects in serial LTM tasks (Smith & Stearns, 1949). More recently, however, Reutener (1969)

and Gumenik & Rossman (1970) reported augmented recall via color isolation in simultaneous STM tasks. In addition, Brodie & Lippman (1970) found that visual isolation may be produced by a symbolic shift from spelled-out numbers (SON) to arabic numerals (AN) in STM. While the latter finding is consistent with Jensen's (1962) finding that a symbolic shift from colored geometric forms to words enhances recall of the isolated item in a serial LTM task, Brodie & Lippman's results may be confounded with differences in difficulty of material because they used a reversed proactive transfer paradigm. Experiment 1 of the present study was conducted to test this possibility.

EXPERIMENT 1 Procedure

The specific sequence of events on each trial was identical to the procedure used by Brodie and Lippman: (1) An asterisk appeared as a ready signal for 2 sec; (2) a diagonal block of three numbers appeared for 2 sec; (3) 10 color matrices of four colors were presented successively for 2 sec each; (4) a question mark appeared and remained in view for 10 sec. The material was presented on an MTA 100 Scholar (teaching machine) controlled by an external timer. Considering that each full advancement of the teaching machine took approximately 1 sec, the total duration of each trial was 47 sec and the duration of the retention interval was 30 sec.

Four groups of 30 Ss each were given four simultaneous STM trials. The actual numbers used during each trial were as follows: 4, 7, 1; 6, 8, 3; 9, 5, 2; and 3, 9, 7. Both the position of the numbers within each block and the sequence of the blocks of numbers remained constant across groups. All Ss were shown identical material except for the symbolic form in which the numbers were presented. Symbolic presentation remained constant across the first three trials and either remained constant or shifted on the fourth trial. The four groups of Ss consisted of two control groups, which were shown either AN or SON over all four trials, and two shift groups which shifted from either AN to SON or from SON to AN.

Subjects

The Ss in Experiments 1 and 2 were 150 introductory psychology students who participated to partially fulfill course requirements. Since both experiments were carried out concurrently, each S was assigned by rotation to one of five treatment conditions.

RESULTS

Scoring

The Ss' responses within the retention interval were scored according to both a

*Requests for reprints should be sent to L. G. Lippman, Department of Psychology, Western Washington State College, Bellingham, Washington 98225.