An adding result in impression formation*

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Ss were presented with a highly polarized piece of information, followed by a same-signed moderately polarized piece of information, and were asked whether the second piece of information led them to like the person described *more*, *less*, or *just the same*. The obtained percentage of *adding* responses was 65%; that is, most of the responses indicated that Ss' impression of the person described became more polarized following addition of moderately polarized information ($p < .001$). More adding was obtained for negatively than for positively evaluated adjectives ($p < .05$).

The purpose of the present study was to determine in a simple, direct fashion how the addition of moderately polarized stimulus information to highly polarized stimulus information of the same evaluative sign changes the polarity of Ss' reports of their subjective evaluations of a stimulus object.

Suppose, given that a trustworthy person is highly likable and a persuasive person is moderately likable, one wished to find out whether a trustworthy, persuasive person is more or less likable than a trustworthy person. One natural way to do this is as follows. Present Ss with the highly polarized piece of information, then with the same-signed moderately polarized piece of information, and ask whether the new information leads them to like the stimulus person more or less. The Ss need only tell the E whether they liked the person *more*, *less*, or *just the same* for him to be able to determine how the moderately polarized information modifies the highly polarized information. Using this method, we aimed to determine whether Ss report *adding* or *averaging* responses, i.e., whether they report that their subjective impressions of the compound stimulus are *more* or *less* polarized than their impressions of the most polarized component stimulus.

Investigators using stimuli drawn from Anderson's (1968a) list of highly favorable (H), moderately favorable (M⁺), moderately unfavorable (M⁻), and highly unfavorable (L) adjectives have uniformly found that their data are dominated by averaging responses when moderately polarized adjectives are integrated with highly polarized adjectives (Anderson, 1965, 1968b; Anderson & Alexander, 1971; Gollob & Lugg, 1973). Whereas the present study used compound stimuli

consisting of two-adjective sets, the studies just cited used four-adjective compound stimuli. Hendrick (1968), however, used positively evaluated two-adjective sets and still found averaging in three separate studies. Like the present study, Anderson and Alexander's study and a study by Manis, Gleason, and Dawes (1966) used ordinal methods of measurement and thereby avoided many problems associated with studies that employ the usual type of rating scale. Both studies obtained averaging results. It was hoped that our use of a different ordinal measurement technique would shed light on the adding-averaging problem.

Although some adding results have been reported (e.g., Fishbein & Hunter, 1964; Hewitt, 1972; Rokeach & Rothman, 1965), most impression formation studies have obtained averaging. Given the apparent robustness of the averaging phenomenon, one would expect Ss to report in our *direct* test that their subjective impressions of a compound stimulus were *less* polarized than their subjective impressions of the most polarized component stimulus. That is, one would expect to obtain averaging responses; one would expect our measurement technique and those of others to yield convergent results.

METHOD

Overview

All 24 Ss made judgments as to whether hearing that a person had a moderately liked (or a moderately disliked) trait in addition to a highly liked (or a highly disliked) trait increased or decreased their liking of the stimulus person. For half of the Ss the scale was presented in one direction and for the other half in the opposite direction. Six male and six female college students served as paid Ss within each of these two conditions. Finally, all Ss made dislike-like ratings of the component adjectives and completed a final questionnaire.

Selection of Stimuli

The stimuli were selected from Anderson's (1968a) four subranges of H, M⁺, M⁻, and L personality trait words. About 12 of the 32 adjectives in each of Anderson's subranges were

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dropped because they have low "meaningfulness ratings," as defined by Anderson, or because they have an exceptionally large variance of likableness ratings across Ss. About five adjectives were eliminated from each set because they seemed to us to refer to temporary rather than to stable traits. Finally, nine adjectives were selected randomly from the remaining words in each of the four subranges.

Forty-one HM^+ pairs (i.e., pairs consisting of a highly liked trait and a moderately liked trait) were constructed in the following manner. All possible combinations of five randomly selected H words and of five randomly selected M^+ words yielded 25 HM^+ pairs. The other 16 HM^+ pairs were obtained by taking all combinations of the remaining four H words and four M^+ words. Forty-one LM^- pairs were constructed by use of a similar procedure.

To help prevent Ss from falling into a fixed answering pattern, 83 different filler items of types HL, M^+M^+ , LL, etc., were used. Subject to the restriction that no stimulus adjectives be repeated on a given page, five items were randomly ordered on each page. As a further control for possible order effects, pages were thoroughly shuffled within each questionnaire.

Instructions to Ss

Ss were told that all names used in the questionnaire referred to male college students. As part of an illustrative example, Ss were asked to consider a student named Bill as being generally reliable, honest, and a good judge of character. They were further asked to "imagine that you are present when Bill is discussing with a friend the characteristics of a student, say Joe, about whom you have no information [other than knowing that he's a student]. In the course of the discussion, *Bill says that Joe is pleasant.*" Ss were told that at a later point in the discussion, "*Bill says that Joe is reserved.*" and were asked to "consider whether this new information inclines you to like Joe more or less. That is, how does Bill's additional judgment modify the impressions of Joe that you formed on the basis of the first judgment given by Bill?" Finally, Ss were told that each item in the questionnaire should be thought of as a shorthand description of the situation just described. The above example is represented by the following item:

Sentence 1: Bill says that Joe is pleasant.

Sentence 2: Bill says that Joe is reserved.

After having read Sentence 2, do you like Joe: Much less _____, Slightly less _____, Just the same _____, Slightly more _____, Much more _____. (In the actual questionnaire, the five response alternatives were typed on a single line.)

On the items for which data were analyzed, the more polarized adjective was always presented first. A different pair of male names was used for every item in the questionnaire.

In order to control for one type of response bias, the scale was presented in the direction shown above for half the Ss and in the opposite direction (i.e., from "Much more" to "Much less") for the other half of the Ss.

Likableness Ratings and Final Questionnaire

At the end of the questionnaire, Ss rated the 36 crucial H, M^+ , M^- , and L words and several filler items on an 11-point scale ranging from dislike (-5) to like (+5). After completing the likableness ratings, Ss completed a final questionnaire in which they were asked to explain in as much detail as possible the factors involved in their judgments.

RESULTS

Following transformation of the ratings on our 11-point dislike-like scale to make them comparable to

Anderson's (1968a) 7-point scale, which ranged from 0 ("least favorable or desirable") to 6 ("most favorable or desirable"), we obtained the following mean ratings: $H = 4.96$, $M^+ = 3.63$, $M^- = 2.20$, $L = 1.02$, which compare well with the mean ratings given by Anderson's normative sample ($H = 5.17$, $M^+ = 3.60$, $M^- = 2.35$, $L = .87$).

If, on an HM^+ pair, a S checked "slightly more" or "much more" when an H word was followed by an M^+ word, we say that the S gave an *adding response*. Similarly, we say that a S gave an adding response if, on an LM^- pair, he checked "slightly less" or "much less" for an L word followed by an M^- word. If S checked "just the same," the response was coded as a "no-change" response. An *averaging response* was scored whenever other alternatives were checked. Over all conditions, the mean percentages of adding responses, no-change responses, and averaging responses were 65%, 22%, and 13%, respectively.

Since simple adding models predict that adding responses will occur and simple averaging models predict that either averaging or "no-change" responses will occur, we decided to focus our analyses on comparing the occurrence of adding responses with the occurrence of both averaging and "no-change" responses combined. The proportions of adding responses were analyzed by use of a three-way analysis of variance which treated sex and direction of scale as between-S variables and the evaluative distinction between HM^+ and LM^- pairs as a within-S variable. The main effect due to sex was significant ($p < .01$, $F = 8.84$, $df = 1/20$), with the proportion of adding responses being .59 for males and .71 for females. The main effect due to the evaluative distinction between LM^- and HM^+ stimuli was also significant ($p < .05$, $F = 4.64$, $df = 1/20$), with the proportion of summative responses being .89 for the negative stimuli and .77 for the positive stimuli. No other main effects or interactions were significant.

The overall adding effect in the present data is large. Of those responses which indicated that *some* change in impression occurred, 83% were adding responses and only 17% were averaging responses. This difference is highly significant ($p < .0001$, $F = 258.03$, $df = 1/20$). Moreover, all but one of our Ss gave more adding than averaging responses within both the HM^+ and the LM^- pairs.

A three-way analysis of variance indicated that the proportions of "no-change" responses were not significantly affected by main effects or interactions involving sex, direction of scale, or evaluation of trait pairs.

DISCUSSION

The Adding Result

Our adding result differs markedly from the averaging results reported by Anderson (1965, 1968c), Hendrick

(1968), and Gollob and Lugg (1973). So, we first consider the possibility that these results are due to some artifact in the study. Perhaps our Ss simply ignored the first sentence of an item and said they liked a person more whenever the second sentence contained a positive trait and less whenever the second sentence contained a negative trait. Of course, we cannot prove that Ss did not use such a strategy. On the basis of their responses to the final questionnaire, however, we can say that Ss describe their judgment process as having been quite complex. No S described his performance on the questionnaire in a way which even remotely suggested that he had ignored the first sentence in making his judgments. Moreover, if one assumes that Ss looked only at the second sentence when making judgments, how could one account for the finding that adding occurred more often for LM⁻ pairs than for HM⁺ pairs? Why should people ignore the first word relatively more often for negative than for positive pairs? In sum, we consider it unlikely that our adding result is due to an artifact of the methodology we used.

It may be thought that our result is due to the particular stimuli we used. This, however, is unlikely in view of the following: Our words were selected from Anderson's list and were all within the appropriate ranges of Anderson's H, M⁺, M⁻, and L categories; the obtained mean ratings compared well with Anderson's mean ratings (see beginning of the present paper's RESULTS section); several other authors have obtained averaging results in studies that used similarly selected groups of stimuli (e.g., Anderson, 1965, 1968b; Anderson & Alexander, 1971; Hendrick, 1968).

How, then, might our adding result be accounted for? We tentatively suggest the following. In our experiment, we asked Ss to tell us how new pieces of information changed their initial impressions; essentially we asked, "Does the new information incline you to like the stimulus person more or less?" Thus, our Ss were asked to adopt a *direct comparison focus*, in which they judged whether they would like a person more if he were described by a single H trait or if he were described by the *same* H trait together with an M⁺ trait. It does not seem implausible to suggest that, when a S's attention is focused on making such a direct comparison, he is more likely to implicitly reason in an "adding" way something like this: "The stimulus person is trustworthy and that's very favorable. He is also persuasive and that's favorable too. So my initially favorable impression of him is supported and further enhanced."¹ That is, it may be that, when an S approaches an impression formation task with an explicit focus on making a direct comparison between a current impression and the impression that results when some new information is added, each positive piece of information (even only slightly positive information) is seen as providing a further basis for liking the stimulus person. The S might, thus, be expected to judge that each positive piece of information further enhances his impression of the stimulus person.

Our study can be profitably compared to a recent study by Hewitt (1972). Using adjectives drawn from Anderson's (1968a) list of H, M⁺, M⁻, and L traits, Hewitt constructed 64 pairs of stimuli in which Person A was described by an H (or L) trait and Person B was described by the *same* H (or L) trait and an M⁺ (or M⁻) trait. For the H vs HM⁺ pairs, Ss were asked whether they would be most attracted to Person A or Person B, or whether they would be attracted equally to both. An analogous question was asked for the L and LM⁻ pairs. Ss who perceived the M⁺ traits as desirable reported greater liking for stimulus persons described by the HM⁺ combinations than for stimulus persons described by the H trait alone. An analogous adding result was obtained for Ss who perceived the M⁻ traits as undesirable. Although the basic methodology used in the two studies differed considerably, both Hewitt's study and ours essentially involved asking Ss to make a direct comparison between an H (or L) and an HM⁺ (or LM⁻) stimulus person where the same H (or L) trait was used in both descriptions. For this reason, we suggest that part of the explanation for Hewitt's adding results may lie in the fact that his study, like the present one, can be interpreted as having involved a direct comparison focus.

The averaging results reported in two papers (Anderson & Alexander, 1971; Anderson, 1968b) may be thought to present a problem for our suggested explanation of Hewitt's and our own adding results. But, as we will now show, this is not the case. In both the Anderson and Alexander and the Anderson studies, stimuli were selected individually for each S to insure that the H and M⁺ words were perceived as desirable and that the L and M⁻ words were perceived as undesirable by each S. In Anderson and Alexander's choice test of the averaging hypothesis, Ss were asked whether they best liked a person described by an H(L) word or a person described by a *different* H(L) word and an M⁺(M⁻) word in combination. This study was similar to Hewitt's but did not involve a direct comparison focus between an H and an HM⁺ (L and LM⁻) stimulus person in which the *same* H(L) trait was involved. Although Ss in Anderson's (1968b) serial presentation task were continuously revising their impressions of the stimulus person, a direct comparison focus does not seem to be involved, since Ss were told that "each response should be made on the basis of all the accumulated information [p. 356]." Ss were asked to *rate* the stimulus person after being given each new adjective; they were not asked to make a direct comparison, as was the case in the Hewitt study and in the present study.

It is obvious that our adding result can be accounted for by a variety of models which assume that responses are a weighted *sum* of scale values. Less obviously, our result can also be subsumed under an *averaging* model. Anderson (1971) has proposed that a rating given to a person described by a single trait A, R_A, is a weighted average of the scale value associated with the trait, S_A, and the scale value associated with an initial impression, I₀, that is

$$R_A = (w_A S_A + w_O I_O) / (w_A + w_O) \quad (1)$$

where w_A and w_O are weights which represent the psychological importance of the information. Anderson's model expresses the compound response, R_{AB} , to stimulus words A and B, taken together as

$$R_{AB} = (w_A S_A + w_B S_B + w_O I_O) / (w_A + w_B + w_O) \quad (2)$$

It is easy to show by example that adding results are compatible with Eq. 1 and 2. If H and M^+ refer to highly favorable and moderately favorable traits, respectively, and if, for example, $S_H = 8.80$, $S_{M^+} = 6.45$, $I_O = 0$, $w_H = w_{M^+} = .40$, and $w_O = .31$, we have by Eq. 1 and 2, $R_{HM^+} = 5.50$, $R_H = 4.96$, and $R_{M^+} = 3.63$. A similar result can be obtained for negatively evaluated stimuli. Thus, Anderson's averaging model can account for our adding result in at least a qualitative fashion.

It may be thought that the 13% averaging result obtained in our study discredits any adding model.² Anderson has argued that the averaging results obtained by him and his associates (e.g., Anderson, 1965; Anderson & Alexander, 1971) critically infirm adding formulations of the impression formation process. Actually, such results only infirm certain simple adding formulations, e.g., that of Fishbein and Hunter (1964). Other adding models can account for both adding and averaging responses, as can be easily verified in the case of the following simple *adding* model:

$$R = \frac{v_k}{k} \sum_{i=1}^k s_i$$

where R denotes the response to a k -component stimulus, v_k denotes a weight that is constant for *all* k -component stimuli and is greater than 1 for all $k > 1$, and s_i denotes the scale value associated with the i th stimulus component. In the case of two positively evaluated adjectives A and B, we have

$$R_A = v_1 s_A; R_B = v_1 s_B$$

$$R_{AB} = \frac{v_2}{2} (s_A + s_B)$$

Then, assuming $v_1 = 1.0$ and $v_2 = 1.6$, an averaging result is obtained when $R_A = 20$ and $R_B = 4$ ($R_{AB} = 19.2$), while an adding result is obtained when $R_A = 20$ and $R_B = 6$ ($R_{AB} = 20.8$). Thus, we conclude that the major qualitative characteristics of our results can be plausibly accounted for by an adding model, as well as by an averaging model.

Effects of Sex and Stimulus Evaluation on Adding

The sex main effect we obtained suggests that female college Ss give adding responses more frequently than do

male Ss. Perhaps the fact that our stimulus persons were described as male college students, rather than simply as people, is relevant in accounting for this result. Relative to male Ss, female college student Ss may give moderately positive and moderately negative information greater weight in determining the likability of male college student stimulus persons. In any case, since it is unusual for sex differences in the relative amount of adding and averaging responses to be reported in studies of impression formation, the present results should be treated cautiously.

We are aware of three other studies (Feldman, 1962; Hewitt, 1972; Wyer, 1971) which have reported data suggesting that proportionally more of Ss' responses increase in polarity when the components of a multitrait description are negatively rather than positively evaluated. Anderson and Alexander (1971), however, have reported the opposite effect. Although we do not know how to account for Anderson and Alexander's contrary result, we think the effect we report is genuine because of its appearance in at least three previous studies.

Warr (1969) and Kaplan (1971) have presented data which strongly suggest that, on the average, positively evaluated trait words have a greater degree of mutual implication than do negatively evaluated trait words. Dustin and Baldwin (1966) and Wyer (1970) have presented data supporting the hypothesis that redundant sets of trait words are averaged relatively more than less redundant sets of words. They argue that the tendency to add is greater to the extent that the added information is not already implied by the original traits, that is, when the additional information is nonredundant. These arguments and data suggest that our finding of relatively less adding for positively evaluated than for negatively evaluated sets of trait words is due in part to there being a greater degree of mutual implication between positively evaluated trait words than between negatively evaluated trait words.

Concluding Remarks

We close with the observation that if, as suggested, our Ss gave adding responses because they adopted a direct comparison focus, an interesting problem arises. Do Ss merely *believe* that adding M^+ information to H information would incline them to like a stimulus person more, although their actual impression of the person described as having an HM^+ combination of traits is less favorable than their impression would be if the person were described by the H trait alone? Or, are Ss who adopt a direct comparison focus *in fact* inclined to like a stimulus person more when M^+ information is added to H information?

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NOTES

1. In this and following examples, we talk only about positively evaluated information. Similar remarks apply for negatively evaluated information.
2. Adding and averaging models differ in that adding models "impose no constraints on the weight parameters whereas averaging models require the weights to sum to one [Anderson, 1971, p. 181]."

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