JOURNAL OF EXPERIMENTAL SOCIAL PSYCHOLOGY 21, 284–300 (1985)

Why Does Self-Reference Promote Incidental Encoding?

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Received September 6, 1984

Answering a question regarding a stimulus word can cause incidental encoding of the word itself. The thoroughness of the encoding depends in part upon what question is answered. For example, saying whether a word describes oneself causes a particularly high degree of incidental encoding. The study reported here investigated several variables that have been proposed as mediators of that effect. As in previous research, subjects completed an incidental-encoding and recall procedure. They then rated (a) the quality and degree of affect that they would experience if each stimulus word were to be applied to them, (b) the importance to them of the behavioral/psychological dimension implied by the stimulus word, and (c) the degree to which they saw themselves as distinctive on that dimension. As in previous studies, deciding whether a word described the self increased the likelihood of subsequent recall. There also was a highly significant interaction such that words judged to be applicable to self were recalled better than those judged not to be applicable. There was no evidence, however, of a mediational role for any other variable studied. Discussion centers on theoretical implications of the data. © 1985 Academic Press, Inc.

Personality and social psychologists have increasingly come to utilize the perspective of cognitive psychology in studying how people organize their knowledge of the world. A basic assumption has been that processing of the rich and varied flow of information available to people entails the use of shortcuts, in which some information is attended to and encoded,

This research was conducted as a doctoral dissertation by the first author under the supervision of the second author. We are grateful to Rebecca Warner, Thomas Ostrom, and Donald Fiske for advice concerning treatment of the data. Request reprints from Charles S. Carver, Department of Psychology, PO Box 248185, University of Miami, Coral Gables, FL 33124.

0022-1031/85 $3.00
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and other information is ignored. Over time and experience, people presumably organize their knowledge into categories, which in turn facilitates the perception and encoding of new events. That is, if a new stimulus has elements in common with an existing mental structure, it evokes that structure. This in turn guides the search for additional information in the stimulus (e.g., Neisser, 1976) and indeed often suggests what information there is to be discovered. These knowledge structures have been given many names, the most generic of which is schemas.

The notion that schematic organization is abstracted from a series of perceptual events has also received empirical support, first in the cognitive laboratory (e.g., Posner & Keele, 1968, 1970; Reitman & Bower, 1973) and later on in studies of social cognition. People apparently develop well-organized schematic structures to represent their stereotypes of other people (e.g., Brewer, Dull, & Lui, 1981; Cantor & Mischel, 1977; Hamilton, 1979), to represent the environments they inhabit (e.g., Brewer & Treyens, 1981; Burroughs, Klein, & Drews, 1982; Kessler, Gordon, Ziplow, & Peterson, 1982), and even to represent themselves (e.g., Greenwald & Pratkanis, 1984; Kuiper, 1981; Markus, 1977; Rogers, 1981; Rogers, Rogers, & Kuiper, 1979).

Against this general backdrop of assumptions, researchers have asked a variety of other questions about the encoding and retrieval of information. For example, some cognitive psychologists have suggested that the likelihood of encoding a piece of information is a reliable function of the elaborateness of the processing that the information receives. Simply attending to superficial features of the stimulus—e.g., the length or sound of a word—entails only what is termed "shallow" processing (Craik & Lockhart, 1972; Craik & Tulving, 1975). Evaluating the stimulus in more complex ways—e.g., making a decision regarding the semantic content of a word—is thought to require "deeper" or more elaborate kinds of processing. This in turn implies a greater degree of involvement of preexisting mental structures or schemas.

Self-Reference Effect

A major vehicle for studying the effects of depth of processing on later retrieval is based upon a phenomenon called "incidental encoding"—so termed because the encoding occurs as a side effect of what is presented to the subject as being the central task. Rogers, Kuiper, and Kirker (1977) used this paradigm to assess the depth of processing that would be involved in another, more "social" kind of judgment. Specifically, subjects were asked to judge whether certain adjectives described them; they were asked to make other judgments for other adjectives. These latter judgments were chosen to be representative of processing strategies identified in previous work as deep ("Does this word mean the same as—?") and shallow ("Is this a long word?"), respectively. Rogers et

al. found that referring words to the self—particularly if subjects decided the words were self-descriptive—resulted in greater incidental encoding than occurred in any other condition. This finding, which we will refer to as the self-reference effect, has subsequently been replicated (Hull & Levy, 1979) and extended to other kinds of stimulus information (Bower & Gilligan, 1979; Keenan & Bailett, 1980; Kendzierski, 1980). There is even evidence that many people use self-reference spontaneously as a strategy to improve their recall (Rogers, 1977; also see Turner, 1980).

What causes the superior encoding that is induced by self-reference? Rogers et al. (1977) reasoned that the self-reference question caused subjects to activate their schematically organized knowledge of themselves, in order to be able to answer the question. This relatively deep processing, in turn, was believed to produce a strong incidental encoding of the stimulus word, particularly if it was congruent with the person's self-schema.

There are several bases for arguing, however, that a more fundamental process underlies or mediates this effect. Investigating the role of several of these potential mediators was the purpose of the present research.

Underlying Processes

Emotion. One plausible argument is that self-reference acts by generating an emotional response. Zajonc (1980), for example, noted that self-referent processing "brings the subject into a cognitive domain greatly charged with affect" (p. 165). Keenan and Bailett (1980) argued similarly that "the crucial dimension underlying memory is not what the subject knows or the amount of knowledge that is used in encoding the item, but rather what the subject feels about what he knows" (p. 25). This reasoning would appear to be consistent with a variety of data suggesting that association of a stimulus with affect can facilitate its later recall (Bower & Karlin, 1974; Sadalla & Loftness, 1972; Strand & Mueller, 1977; Warrington & Ackroyd, 1975; see Isen, 1984, for a broader discussion of issues involved in the encoding and retrieval of affectively relevant material). Though at least two projects have examined affective variables in the context of the self-reference paradigm (Ferguson, Rule, & Carlson, 1983; Mueller, Heesacker, Ross, & Nicodemus, 1983), neither examined the role of affect in the self-reference effect per se.

There are at least two ways in which affect might influence self-referent encoding. One possibility is that encoding is a product of the mere intensity of the affect generated, independent of the nature of the affective quality (see, e.g., Bower, 1981; Dutta & Kanungo, 1967; Keenan & Bailett, 1980). Data from several studies provide indirect support for this possibility (Ferguson et al., 1983; Holmes, 1970; Robinson, 1980). Perhaps, then, items that generate a good deal of affect of any sort when applied

to the self are encoded most thoroughly, and thus are responsible for the self-reference effect.

Alternatively, it could be argued that positive affect facilitates processing and negative affect interferes with processing (Rogers, 1981). This argument is supported by the finding that experimentally induced depression can reduce recall of target words embedded in sentences (Ellis, Thomas, & Rodriguez, 1984). There is also a variety of less direct support for this possibility (e.g., Jersild, 1931; Stagner, 1931; Lishman, 1974). As applied to the self-reference effect, this position would suggest that items generating positive feelings when referred to the self are encoded most thoroughly, and thus recalled later on, whereas items generating negative feelings are encoded more poorly.

Importance. Emotional response per se is not the only plausible mediator of the self-reference effect, of course. A second possibility was suggested by Markus (1977), in earlier research on the self-schema. Markus defined schematicity with regard to a given trait dimension partly on the basis of her subjects' self-rating of the trait's importance to them. That is, subjects for whom the trait was rated to be important were termed schematic; those for whom it was rated as unimportant were termed aschematic. This difference proved to predict behavioral differences of several types.

Just how important is importance? Data on this question are sparse. But Cantor and Kihlstrom (1981) have speculated that of the dimensions involved in processing self-relevant information, "it may be that the importance rating is the crucial one, and that the self includes those features that are important to the person, regardless of how self-descriptive they are" (p. 37). Perhaps, then, information pertaining to a psychological dimension that is important to the subject is processed most extensively; and perhaps these are the items that are responsible for the self-reference effect.

Distinctiveness. Yet a third possibility is that cognitive processing is affected by the degree to which a particular bit of knowledge is informative. That is, some parts of any broad data base yield richer information than do other parts. For example, behavior that is unusual or distinctive commands attention and is weighted heavily in forming impressions of others (Jones & Davis, 1965). McGuire and colleagues (McGuire & McGuire, 1980; McGuire, McGuire, Child, & Fujioka, 1978; McGuire, McGuire, & Winton, 1979; McGuire & Padawer-Singer, 1976) have also provided evidence that people attend selectively to aspects of them*selves* that are least shared by others. This suggests that characteristics which people perceive as particularly distinctive about themselves may prompt the deepest processing. Perhaps these are the items that are responsible for the self-reference effect in incidental encoding.

These various possibilities were tested in the study reported below.

Subjects in this study were shown a set of stimulus words (descriptive adjectives). For each word they made either a self-reference decision (does the word describe you?) or a decision that did not involve the self (does the word describe Walter Cronkite?). After a brief interpolated task, the subjects were asked to write down as many of the stimulus words as they could recall. Subjects then received a list of all stimulus words used in the incidental encoding task. After receiving a thorough instructional orientation, they rated each word in terms of the affect that would be aroused in them if the word were applied to them, the importance that they personally ascribed to the psychological dimension to which the word pertained, and their distinctiveness with regard to that dimension. These ratings, along with target condition (i.e., reference to self vs Walter Cronkite) and applicability judgment (yes vs no) were then used as predictors of recall.

METHOD

Subjects were undergraduates at the University of Miami. To ensure that subjects would be familiar with the stimulus words to be used, the following eligibility criteria were imposed: Participants were required to be native English speakers, and to have a B or higher grade point average. Twenty-five females and seventeen males who satisfied these requirements participated in group sessions, with groups ranging in size from 8 to 10 persons.

Procedure

Incidental recall task. Stimulus words were chosen from Anderson's (1968) set of trait descriptive adjectives. Anderson separated this list into four subranges of likableness. Words were selected equally from each subrange for this study, to permit a wide range of reactions when the words were rated for affective reaction, importance, and distinctiveness. In addition, words were selected to represent the following domains: social (e.g., popular, friendly), academic (e.g., studious, thoughtful), and mood (e.g., angry, happy). In total 48 words were selected. The order of presentation of words was determined randomly but remained constant for all subjects. Eight neutral words were also selected to be used as buffer items. Four buffer items were included at the beginning of the list and four were placed at the end. Recall and ratings of the buffer items were not included in the data analyses.

When they arrived at the research site, subjects received a rating sheet which consisted of a series of alternating questions: (1) Does this word describe Walter Cronkite? (other-reference condition) and (2) Does this word describe you? (self-reference condition). Following each question was a "Y" and an "N," representing "yes" and "no" responses, respectively. Each trait adjective was to be rated only once by each subject. Two rating forms were used to counterbalance the order in which the statements appeared. Thus, in each testing session some subjects rated a given stimulus word for self and some for Walter Cronkite. Rating sheets were randomly distributed to subjects.

After passing out the rating sheets, the experimenter indicated that the subjects' task was to evaluate a series of words, which would be presented one at a time. For each word, the subject was to (silently) read the question that appeared on the relevant line of the answer sheet, and answer the question by circling one of the two letters. In case of mixed reactions, subjects were to choose the response that was the more accurate of the two. After ascertaining that subjects understood their task, the experimenter began reading

the stimulus words. Five seconds were provided for subjects to read the question, then the word was read, then 10 s were allowed for subjects to decide on their answers.

When all words had been presented, subjects were given a 3-min distraction task, to interfere with possible rehearsal of the stimulus material. Subjects were then asked to recall as many of the stimulus words as they could, in any order, by writing down each word remembered. Subjects were told that correct spelling was not required, in order to encourage them to try as hard as possible. Five minutes were allowed for the free-recall portion of the study.

Rating of the stimulus words. After the written lists of recalled words were collected, booklets containing instructions for rating the stimulus words were passed out along with rating sheets. An attempt was made to enhance subjects' involvement in these ratings by describing the importance of making accurate judgments. Furthermore, a rather extensive set of instructions was given to subjects in order to provide a clear orientation to the rating task. Specifically, subjects were told that they would be making several judgments concerning the list of words, that the judgments were different from each other but that the differences were subtle. Separate paragraphs described in detail each of the three types of judgment—affect, importance, and distinctiveness—and gave examples to illustrate each. A separate page contained the three judgment stems and labeled rating scales for each. Subjects were asked to use these scales to make their three judgments about each adjective (i.e., by choosing one number for each scale).

Subjects first were to rate the adjective in terms of the feelings that it would evoke in them. As an illustration, it was pointed out that saying a person is "red-headed" provides factual information, but saying a person is "nasty" implies some degree of feeling about the person. The ratings of affect were to be personalized, in the sense that they were to represent the affective reaction the *subject* would have if the word were to be applied *to him or her.* Ratings for affective reaction were made on a 9-point scale, with 1 indicating a geat deal of positive feeling, 3 a moderate amount of positive feeling, 5 no feeling at all, 7 a moderate amount of negative feeling, and 9 a great deal of negative feeling. This rating thus involved both quality and intensity of affective reaction (this fact was also pointed out to the subject).

The affect ratings were also post facto recoded into a 5-point scale, to express intensity of affective reaction without regard for affective quality. This was done in order to test both hypotheses concerning the role of affect in incidental encoding. A rating of 1 on this recoded scale indicated no affective reaction, 3 a moderate reaction, and 5 an intense reaction.

The second rating concerned the importance that subjects personally ascribed to the behavioral or psychological dimension that the adjective referred to. This rating was to be made without regard to whether or not the subjects felt the stimulus word itself was applicable to them. They were to judge only how much it *mattered* where they stood on that dimension. As an illustration, it was noted that a person who worked as a computer programmer and did not care about social relationships might not consider the dimension of "politeness" very important; a person who worked as a waiter and was interested in maintaining social relationships might view that dimension as extremely important. Ratings of importance were made on a 5-point scale, with 1 indicating that the behavioral dimension reflected in the word was not at all important to the person, 3 that it was moderately important, and 5 that it was extremely important.

Finally, subjects were to rate the degree to which they saw themselves as distinctive on the dimension implied by the stimulus word. It was pointed out that one could be distinctive in a variety of ways—i.e., having a characteristic to either a high degree or a low degree would make one atypical or distinctive. As an illustration, it was noted that both the president of General Motors and a skid row wino are both quite distinctive with regard to the dimension of "ambitiousness." Subjects were not to rate the presence or

absence of the characteristic the word denoted; they were simply to indicate the degree to which they saw themselves as distinctive in that domain. Ratings of distinctiveness were made on a 5-point scale, with 1 indicating a low degree of distinctiveness, 3 a moderate degree of distinctiveness, and 5 an extremely high degree of distinctiveness.

After making these three ratings for each word, all subjects were given a second instructional orientation and were asked to make comparable ratings concerning the words as they would apply to Walter Cronkite. This was done in order to examine variables that might facilitate recall of other-referenced items, which was a secondary aim of the study.

RESULTS

Preliminary analyses of subjects' ratings of the 48 stimulus words in terms of affective reaction, importance, and distinctiveness revealed the occasional occurrence of significant between-subjects differences in use of the rating scales. For this reason z-score transformations were computed across the 48 stimulus words for each dimension rated. This was done separately for each subject. The intercorrelations of these transformed ratings are included in Table 1. Although there is obviously some degree of overlap among the ratings, the correlations are not so high as to suggest that subjects failed to distinguish the rating dimensions from one another.

After making the transformations described above, we analyzed the recall data in several different ways. As an initial test of our hypothesis, correlations were computed between recall of self-referenced words and the four indices under examination as potential mediators of the self-reference effect. Only one of the four correlations was statistically sig-

TABLE 1

CORRELATIONS AMONG RATINGS OF AFFECT, IMPORTANCE, DISTINCTIVENESS, AND AFFECTIVE INTENSITY (ALL AS PERTAINING TO THE SELF), APPLICABILITY JUDGMENT (YES/NO), AND RECALL AMONG WORDS THAT WERE REFERRED TO THE SELF IN THE INITIAL TASK

	Importance	Distinctiveness	Absolute affective intensity	Applicability judgment[a]	Recall[a]
Affect	−.33	−.49	−.07	−.46	−.05
Importance		.51	.42	.28	.05
Distinctiveness			.25	.38	.06
Absolute affective intensity				.10	.01
Applicability judgment					.11

Note. Affect ranges from extreme positive (1) through neutral (5) to extreme negative (9); absolute affective intensity is a recoding of these values, from neutral (1) to extreme (5). Correlations were computed from z scores bearing on 24 stimulus words, each rated by 42 subjects (df = 1006). Values greater than .06 are significant at the .05 level; those greater than .08 are significant at the .01 level.

[a] Because applicability judgment and recall are dichotomous, these two columns are Kendall rank-order correlations.

nificant. As is apparent from the final column of Table 1, however, the significance of even this relationship is highly dependent upon the large number of degrees of freedom involved. None of the correlations exceeded .06.

The data were further analyzed by means of discriminant function analysis (e.g., Morrison, 1974). This procedure computes the linear combination of weighted variables that produces the greatest statistical discrimination between two groups. The grouping to be predicted in this case was recall of the stimulus words, coded dichotomously (yes/no). The analysis (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975) proceeds by selecting the single variable at each step which has the highest value on the selection criterion. This variable is then included in the discriminant equation. At each step, each of the previously selected variables is tested to determine if it still makes a sufficient contribution to the equation; if not, it is discarded. This process continues until no additional variables make a significant contribution to the equation. The final step provides a significance test for the entire equation, as well as for the contribution each individual variable makes to the final equation.

Discriminant function analysis was employed in order to maximize the usefulness of the information available in the data. Specifically, this technique permits the use of idiographic ratings along each predictor dimension, rather than relying on nomothetic scalings. In addition, inasmuch as all 42 subjects rated all 48 stimulus words, this procedure allowed us to examine a large number (2016) of instances of incidental recall in assessing the relation between recall and the various predictor dimensions. Finally, inasmuch as the ratings were made on multipoint scales, this procedure permits analysis of the full range of variability in the ratings, rather than artifically reducing the variability by splitting at the median (see, e.g., Cohen & Cohen, 1975).

The only obvious liability of this technique for the present data is that it treats each subject's response to each item (rather than the subject) as the unit of analysis, thus inflating degrees of freedom (as noted above). For this reason, we used in these analyses a more conservative criterion for inclusion in the discriminant equation ($p < .01$) than is usually the case.

The data set for the discriminant analyses included all 2016 cases of potential recall (items $\times$ subjects). There were 10 main effect predictor variables: the rating dimensions pertaining to self and pertaining to other (i.e., bidirectional affect, affect intensity, importance, and distinctiveness), target (i.e., whether the initial applicability judgment for the adjective had concerned self or Walter Cronkite), and applicability (whether the item was or was not judged to describe the target).[1] Five 2-variable

[1] The dichotomous variables were entered as 1 vs 0 and as 1 vs -1, in two separate sets of analyses. The results were virtually identical.

interactions were created: between target and applicability, and between target and each of the self-relevant rating dimensions. (The procedure for creation of each interaction was to multiply its contributing values by each other.) Four 3-variable actions were also created among target, applicability, and each rating dimension pertaining to self (e.g., target $\times$ applicability $\times$ self-relevant affect). Four comparable interaction variables were also established with respect to ratings made for Walter Cronkite.

The discriminant analyses were conducted in several different ways. In one procedure all main effects and interactions were entered at once. In a second procedure all theoretically relevant main effects (target, applicability judgment, ratings of the words with respect to self-affect, intensity, importance, and distinctiveness) were entered at the first level, followed by theoretically relevant two-variable interactions at the second level, followed by the remaining main effects and interactions at the third level. In a third procedure, the two-variable interactions were entered first, then the theoretically relevant main effects, then the remaining variables.

Though the results of these various procedures differed slightly from each other, there also was a high degree of consistency among the results. The final discriminant equation was in each case highly significant, with a Wilks' λ (2014) = .96, $p < .0001$; a multiple correlation of .19; and a χ^2 (2) = 75.14, $p < .0001$. Examination of the contribution of individual variables to this equation, assessed by change in Rao's V, revealed that only two variables contributed at beyond the .01 significance level that had been adopted: the main effect for target, and the target $\times$ applicability interaction (see Table 2). The significance levels of these two effects varied somewhat with the order of inclusion, but in no case was either effect less significant than $p < .0002$.[2] To state these effects in simple terms, recall was increased by referring the word to oneself (the self-reference effect); furthermore, the self-reference effect was stronger among words for which the applicability judgment was affirmative than among those for which it was not.

Additional analyses. Several further analyses were conducted to examine this pattern of outcomes more closely. First, given the interaction just described, a question arises as to the robustness of the self-reference main effect. A more stringent test of this phenomenon would be to examine *only* the data for words that were judged *not* to be applicable to whichever target they had been referred to. Replication of the main

[2] Additional analyses were conducted using a more liberal criterion for inclusion into the equation ($p < .05$). Under this more liberal criterion, two additional predictors reached significance under each computational procedure: distinctiveness ratings of words with respect to Walter Cronkite and the interaction between this rating and applicability judgment (independent of target). Keeping in mind the liberalness of the data treatment in terms of degrees of freedom, it seems most sensible to regard these effects as products of chance.

TABLE 2

PERCENTAGE OF ITEMS RECALLED AS A FUNCTION OF TARGET THE ITEM WAS REFERRED TO (SELF OR WALTER CRONKITE) AND APPLICABILITY DECISION (YES OR NO)

	Yes	No
Self	42%	32%
	(586)	(422)
Walter Cronkite	22%	23%
	(484)	(524)

Note. Total item counts are in parentheses.

effect for target in this subsample would represent strong evidence that self-referencing per se produces incidental encoding.

Accordingly, additional discriminant analyses were conducted among data pertaining to words for which the applicability judgment was "no" (946 of the 2016 words). These analyses consistently yielded a significant main effect for self-reference, Wilks' λ (944) = .99, $p < .001$; $\chi^2(1) = 10.74$, $p < .002$, multiple correlation = .11. No other effect was significant. Thus the self-reference effect was obtained even among items judged not to be self-applicable.

Other analyses focused selectively on recall for words that had been judged as to applicability to the self (i.e., ignoring words that had been referred to Walter Cronkite). Implicit in the interaction described earlier is that the *applicability* judgment should display a main effect relationship to recall, if one examined only data pertaining to *self-referenced* words. This was confirmed in a discriminant analysis that was restricted to that half of the data. The affirmative decision resulted in significantly greater recall among these words, Wilks' λ (1006) = .99, $p < .0001$; $\chi^2(1) = 11.29$, $p < .001$.

Another set of analyses was predicated on the following consideration. The nature of the statistical procedure used in these analyses is such that if two predictor variables share variance accounted for, the stronger of the two predictors is "credited" with that variance. Thus the possibility would seem to exist that the very large effect for applicability was weakening potentially observable effects for the other predictors. To assess this possibility, an additional analysis was conducted on data pertaining to self-referenced words, without inclusion of the applicability judgment as a predictor. Though this analysis did include all other predictors, the overall equation failed to attain significance. Apparently the applicability effect did not mask the effects of other predictors in the original analyses.

One last supplementary analysis was undertaken to test the possibility that the hypothesized mediators might interact *with one another* in predicting recall. Two-variable interactions between these dimensions and

three-variable interactions among applicability and pairs of dimensions were created. These 12 interactions, along with the applicability main effect, were entered into an analysis that was limited to self-referenced words. The overall analysis again was significant, but it proved to be accounted for exclusively by the effect of applicability.

Adjectives rated for the other. An analysis was also conducted to focus selectively on recall for adjectives that had been judged initially as to their applicability to Walter Cronkite. This procedure thus assessed any effects of the various dimensions upon other-referent processing. Interaction terms were created between the applicability rating and each dimension rated for Walter Cronkite. Similar interaction terms were also created between applicability judgments for Cronkite and ratings of the words pertaining to the self. A stepwise discriminant analysis with the following two levels of inclusion was performed. The first level included applicability, and all main effects and interactions involving ratings pertaining to Walter Cronkite; the second level included all main effects and interactions involving ratings pertaining to the self. Using the inclusion criterion of $p < .01$, no variable made sufficient contribution in prediction to enter the equation.

Analysis controlling for verbal ability. A final attempt to gain information on the mediation of the self-reference effect was based on the possibility that verbal facility might account for an important share of the variance in this recall task. If this were so, a measure of verbal facility might allow the systematic removal of error variance, thereby allowing the emergence of effects that might otherwise be obscured. In line with this reasoning, we sought to obtain subjects' scores on the verbal portion of the SAT. These scores were available for 32 of the 42 subjects. Additional discriminant analyses were then conducted, identical to those described above with one exception: verbal SAT scores were entered as the first predictor (thus treating it as a covariate). The results of these analyses did not differ appreciably from those described above.

DISCUSSION

This study examined the effects of several proposed mediators of the self-reference effect in incidental encoding. The study yielded a strong replication of the self-reference effect (Rogers et al., 1977), indicating again the robustness of the basic phenomenon. We also found strong evidence that this phenomenon is even more robust if the self-reference judgment is affirmative, a finding that was hinted at, but was much weaker in the data of Rogers et al. (1977). We note that a similar finding has since been reported by Flynn (1983).

Despite the present replication—and indeed elaboration—of the self-reference effect, we found absolutely no support for any of the hypotheses that had been posed concerning its mediation. No predictor variable

interacted significantly either with self-reference or with affirmative self-reference in predicting recall, even despite the use of a relatively liberal statistical treatment.

How Shall We Interpret the Findings?

Once the conceptual basis for a prediction has been developed, the absence of the predicted relationship is traditionally viewed with some degree of skepticism. It is often easier to believe that the researchers failed to operationalize the variables appropriately than it is to believe that the variables in question are unrelated. For this reason it seems important to emphasize the nature of the present procedure, in particular the elaborateness of the instructions that were provided to subjects as they generated the data that served as the predictor variables.

To reiterate, each participant was asked first to indicate whether certain of the words were or were not descriptive of himself or herself. Participants later were asked to judge the valence and degree of feeling that would be aroused if the word were to be applied to them. Note that if the subject had judged the word *to be* self-descriptive, the subject had thereby done virtually that: applied the word to himself or herself. In addition to this judgment, participants also rated the degree to which the psychological/behavioral dimension was important to them and the degree to which they felt distinctive in regard to the dimension. For each of these judgments, subjects were provided extensive explanatory material and examples to guide them. All judgments appear to have been made thoughtfully. Yet none of these judgments was implicated in the self-reference effect, an effect which itself was quite strong. Our conclusion is that the hypotheses concerning possible mediating variables received a fair test; they simply were disconfirmed.

What are the implications of this disconfirmation? Most obviously, we do not yet understand the self-reference effect well enough to be confident about why it happens. Affect does not appear to be the key, nor does subjective importance nor subjective distinctiveness. What, then, is left? The most salient possibility would appear to be the fact that self-related information is so extensive and so rich in personal experiences (cf. Bellezza, 1984), and that any schematic organization of this information must necessarily be articulated and elaborate. The sheer depth, breadth, and elaboration of that knowledge structure may be what gives it the power to generate such a high incidence of incidental encoding. This line of argument is consistent with the finding that a similar facilitation of incidental encoding occurs when words are referred to very familiar persons, those about whom one's knowledge is deep, extensive, and related to the self, rather than casual and superficial (Bower & Gilligan, 1979).

This reasoning would also appear to be consistent with a second aspect of our findings: The fact that the incidental encoding produced by self-

reference was further exaggerated by the affirmation that the word *was* applicable to oneself. A comparable increase in recall did not occur, however, among words referred to the unfamiliar-other target. This differential effect of affirmation doubtlessly is open to multiple interpretations, but one plausible argument is that it is attributable to a difference in elaboration of the memory structures involved in the applicability decision.

Researchers investigating learning and decision-making phenomena of several kinds have found evidence that positive instances are more likely to be stored than are negative instances or nonoccurrences (e.g., Jenkins & Ward, 1965; Einhorn & Hogarth, 1978), a bias that in the context of discrimination learning has been termed the feature-positive effect (Jenkins & Sainsbury, 1970; Newman, Wolff, & Hearst, 1980). By implication, at least, that literature appears to be restricted to cases in which subjects are making an active attempt to learn something. The present research extends that principle to *incidental* encoding—but this extension is limited to the self-reference decision.

This limitation on our findings suggests, in turn, some interesting questions about what variables influence the preferential encoding of affirmative information more generally. We wonder, for example, whether that bias might be more pronounced in contexts where fairly elaborated knowledge structures already exist (analogous to the self-reference condition in the present study), and less pronounced when there is less preexisting elaboration of knowledge (analogous to the other-reference condition). This possibility, which would be consistent with evidence reviewed by Sherman and Corty (1984) regarding the use of other heuristics, appears to be one that deserves explicit research attention.

Broader Implications

In more general terms, the present findings appear to suggest a separation between the cognitive processes involved in encoding, and the affective or judgmental processes that are involved in weighting importance of information or responding to it emotionally. Interestingly enough, these data are not alone in suggesting such a division. Similar points seem to be made by three other recent articles. One of them (Dreben, Fiske, & Hastie, 1979) reports a study of whether attributes used to form an impression of another person (an affective judgment of likability) would be recalled better than attributes unrelated to the impression. The correlation between ratings of likability and recall of relevant attributes proved to be quite low. Dreben et al. suggested for that reason that recall may be governed by mechanisms distinct from those governing affective judgments, a conclusion that seems consistent with the present findings. Subsequent research by Taylor and Falcone (1982), using very different experimental procedures, yielded a conceptual replication of the finding reported by Dreben et al.

A final article of relevance to this point (MacWhinney, Keenan, and Reinke, 1982) discusses research in which subjects' GSR responses were monitored while they listened to the conversational statements of others (either as an active participant in the interaction or via videotape). Three days later, subjects received a surprise test, in which they were asked to identify statements made by others in the group. The critical predictor of correct recognition was what MacWhinney et al. termed "interactional content" in the statement—i.e., the degree to which the statement conveyed pragmatic information *referencing the speaker–listener relationship*. Given that interactional content conveys important implications for the self vis-à-vis the other interactant, that construct has a striking conceptual relationship to the concept of self-reference in the present research. Presumably the greater recall of statements heavy in such content occurred because of the greater involvement of the self-schema in processing that material, compared to other material.

MacWhinney et al. (1982) found that GSR responses were indeed related to the nature of the statements made by the interactants. In general, when interactional content was high, arousal went up. But arousal level did *not* significantly predict subsequent memory for the statements, though interactional content did do so. As MacWhinney et al. concluded, the connection between interactional content and arousal, though clear-cut, had no obvious consequences for memory. As with the findings of Dreben et al. (1979), these data appear to be quite consistent with those of the present research.

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