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The Role of Category Accessibility in the Interpretation of Information About Persons: Some Determinants and Implications

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Many personality trait terms can be thought of as summary labels for broad conceptual categories that are used to encode information about an individual's behavior into memory. The likelihood that a behavior is encoded in terms of a particular trait category is postulated to be a function of the relative accessibility of that category in memory. In addition, the trait category used to encode a particular behavior is thought to affect subsequent judgments of the person along dimensions to which it is directly or indirectly related. To test these hypotheses, subjects first performed a sentence construction task that activated concepts associated with either hostility (Experiment 1) or kindness (Experiment 2). As part of an ostensibly unrelated impression formation experiment, subjects later read a description of behaviors that were ambiguous with respect to hostility (kindness) and then rated the target person along a variety of trait dimensions. Ratings of the target along these dimensions increased with the number of times that the test concept had previously been activated in the sentence construction task and decreased with the time interval between these prior activations and presentation of the stimulus information to be encoded. Results suggest that category accessibility is a major determinant of the way in which social information is encoded into memory and subsequently used to make judgments. Implications of this for future research and theory development are discussed.

When individuals are asked to judge themselves or another person, they are unlikely to perform an exhaustive search of memory for all cognitions that have implications for this judgment. Rather, they are likely to base their judgment on some subset of these cognitions that is most readily accessible (Tversky & Kahneman, 1973, 1974). Using quite different research methodologies, Carlston (1977) and Lingle and Ostrom (in press) have both shown that once a judgment of a stimulus person has been made on the basis of new information, this judgment is subsequently used as a basis for later inferences about the person independent of the information upon which the judgment was originally based. Similarly, Ross and his colleagues (Ross, Lepper, & Hubbard, 1975; Ross, Lepper, Strack, & Steinmetz, 1977) have found that once a person has constructed an explanation of an event involving himself or another person, this construction, rather than the information that stimulated it, is used to predict the likelihood of future events. Each body of research therefore suggests that the most easily accessible cognitions about an object or event (i.e., those that have been acquired and used most recently) have a major influence on future judgments.

Similar considerations arise when a person

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is asked to interpret new information about a social stimulus. In many instances, the information one receives is ambiguous; that is, it can be interpreted in more than one way. For example, information that someone told his girl friend that her new hair style is unattractive could be interpreted, or *encoded,* as either "honest" or "unkind." Which encoding is actually made may depend upon which of the two relevant concepts (honest or unkind) is most easily accessible at the time the information is received (cf. Bruner, 1957). Once the behavior is encoded as an instance of one of these trait concepts, the implications of this encoding, rather than those of the original behavioral information, may be used as a basis for subsequent judgments about the person (Carlston, 1977; Higgins, Rholes, & Jones, 1977). If this is true, judgments of a person may often be affected substantially by rather fortuitous events that lead one or another concept to be more accessible to the judge at the time information about the person is initially received.

This paper reports two in a series of studies designed to investigate the possibility raised above and to explore its implications. In so doing, they supplement and extend an earlier study by Higgins, Rholes, and Jones (1977). These authors reasoned that if subjects were required to use trait terms in the course of performing one task, these terms would become more accessible and therefore more likely to be used to encode subsequent behavioral information about a person in an unrelated context. To test this hypothesis, subjects first performed a color-naming task that required them to remember four trait terms. In experimental conditions, the traits were all potentially applicable for encoding a normatively based set of behavioral descriptions (e.g., thinking about crossing the Atlantic in a sailboat), whereas in control conditions they were all inapplicable. Moreover, in some cases the four terms all had positive evaluative implications (e.g., "adventurous"), while in other cases they all had negative evaluative implications (e.g., "reckless"). As part of a second, ostensibly unrelated experiment, subjects read a story about a stimulus person that contained these behavioral descriptions. Subjects then both wrote a description of the target person in their own words and estimated how much they liked this person. Experimental subjects tended to describe the target person with trait terms that were the same as or synonymous with those to which they had been exposed in the color-naming task. In addition, their subsequent ratings of the target person were biased in the direction of the evaluative implications of these terms. In contrast, control subjects who were exposed to trait terms that were inapplicable for encoding the target's behavior did not vary systematically in either the evaluative implications of their free descriptions of the target or their ratings of him.

The findings of Higgins et al. provide intriguing support for the general hypothesis that once a concept is activated or "primed" as a result of its use for one purpose, its relative accessibility is enhanced, and its likelihood of being used to encode subsequent information increases. Moreover, the implications of the encoding, rather than those of the original stimulus material, are used as a basis for later judgments. Several additional questions are raised by these results, however. First, in the Higgins et al. study, subjects were primed with specific trait labels, each of which presumably represented a particular cognitive category or concept. To the extent that trait and behavioral concepts are interrelated in memory, however, the accessibility of trait concepts may also be increased by priming specific behaviors that exemplify these trait concepts. In this regard, it may be useful to conceptualize the representation of person information in memory in terms of schemata, or configurations of interconnected traits and behaviors at different levels of generality (cf. Cantor & Mischel, 1977). Such schemata may be hierarchical, with trait terms centrally located and behavioral instances of the traits more peripheral. Once a schema is activated, it may then be used to interpret and organize subsequent information (Bransford & Johnson, 1972; Lingle & Ostrom, in press). Thus, exposure to behavioral instances of a trait in one context may activate a schema associated with this trait, and the schema may then serve as a basis for inter-

preting subsequent behavioral information that is received in other contexts (Wyer & Srull, in press).

This reasoning implies that it is not necessary to prime the name of a trait in order to increase the likelihood that the schema associated with it will be used to interpret subsequent information. Rather, one needs only prime behavioral instances of the trait that are represented in the schema. It is conceivable, however, that several such instances must be primed in order to activate the schema itself. One reason for this is that behaviors are often ambiguous; that is, they can be considered instances of several different traits. To this extent, they are less likely to be interpreted as representative of any given trait when considered in isolation. Thus, it is reasonable to expect that the likelihood of activating a trait schema will increase with the number of behavioral instances used to prime it.

Once a trait concept or schema is activated as a result of exposure to representative behaviors, its accessibility, and thus its effect on the interpretation of subsequent information, is likely to decrease over time. This prediction is both intuitively reasonable and formally derived on the basis of several existing theoretical formulations. For example, Wyer and Srull (in press) have developed a model of social information processing in which the accessibility of a primed concept is postulated to decrease as a function of the number of other potentially relevant concepts used during the subsequent time interval. Since the likelihood of using at least one other potentially relevant concept becomes greater as the time interval increases, the likelihood of using the initially primed concept to interpret new information becomes correspondingly less.

Wyer and Carlston (1979) have formulated a model of person memory that also predicts this decrease. According to this formulation, which in many respects is similar to the semantic memory model of Collins and Loftus (1975), the residual "excitation" that remains at the location of a previously activated trait concept decreases over time once the concept is no longer used. As a result, increasingly greater amounts of excitation are required to reactivate the concept as time goes on, and the trait category is less likely to be invoked.[1] The two models therefore differ in that the first attributes the decrease in accessibility to be a function of interference effects (the likelihood of which increases over time), while the second attributes the decrease to be a function of time per se, independent of any interference produced by other concepts.

To summarize, then, the above reasoning implies that the accessibility of a trait schema, and therefore the likehood that it will be used to interpret new information, will increase with the number of schema-related behavioral concepts that have been activated prior to the receipt of this information but will decrease with the length of time between the activation of these concepts and acquisition of the new information to be interpreted. The present set of experiments tests these hypotheses.

The experiments reported extend upon the findings of Higgins et al. in one other important way. Specifically, Higgins et al. found that the accessibility of trait terms that were inapplicable for encoding the behavioral information did not affect subsequent evaluations of the target person. This suggests that priming does not have a direct influence on subjects' judgments of the target but affects these judgments only through its mediating influence on the interpretation of the target's behavior. Once the behavior has been encoded in terms of a given trait (e.g., "hostile"), however, and an overall impression of the target has been formed on the basis of this encoding, the target may then be ascribed other, evaluatively similar traits (e.g., "unintelligent") that are related only on the basis of subjects' implicit personality theories (Rosenberg & Sedlak, 1972). This possibility

[1] The effects of priming appear to dissipate very rapidly with the semantic tasks that are typically used to test the Collins and Loftus model. Wyer and Carlston's extension of the model does not postulate this rapid a decay of excitation, however. More important, the stimulus domain and judgment tasks to which the Wyer and Carlston model is theoretically applied are quite different from those considered by Collins and Loftus.

was also explored in the present set of experiments.

Method

Overview

Two experiments were run. The first investigated the effects of priming concepts related to hostility. The second was a conceptual replication in which concepts related to kindness were primed. The procedure used was the same in each experiment. Subjects first performed a "word comprehension" task in which they constructed sentences from sets of words. These sets were constructed so that each sentence completed would describe a behavior either related or unrelated to hostility (kindness). The total number of questionnaire items and the proportion of items related to the concept being primed were both systematically varied. Then, as part of a separate experiment on impression formation, subjects read a paragraph about a hypothetical target person who manifested a series of behaviors that were ambiguous with respect to the trait being primed. Judgments of both the target person and of individual behaviors were then analyzed as a function of the length of the priming questionnaire (30 or 60 items), the proportion of hostile (kind) priming items in the questionnaire (20% or 80%), and the time interval between completion of the priming task and the presentation of the target information (no delay, 1 hour, or 24 hours).

Ninety-six introductory psychology students (8 in each experimental condition) participated in Experiment 1 for course credit, and a different group of 96 students participated in Experiment 2.

Selection of Behavioral Descriptions

Experiment 1. To select behavioral descriptions that varied both in terms of the hostility they conveyed and in terms of the ambiguity of their implications, 43 subjects who did not participate in the main experiment were asked to rate a large pool of individual behaviors along a scale from 0 ("not at all hostile") to 10 ("extremely hostile"). From this pool were selected 5 behaviors that were judged to convey high hostility ($M = 8.08$) and 5 that were judged to convey low hostility ($M = .58$). In addition, 10 "ambiguous" behaviors were selected on the basis of two criteria: first, the mean hostility rating of each ambiguous behavior ($M = 3.99$) was lower than the mean rating of any behavior identified as hostile and higher than that of any behavior identified as nonhostile; second, the standard deviation of ratings for each ambiguous item was greater than the largest standard deviation of any item in either of the other two groups ($SD = 2.76$). The 10 ambiguous items were randomly divided into two groups of 5, and each group was then used to construct a vignette describing a hypothetical target person. In addition, all 20 behaviors were used as test items to be rated individually in a manner to be described.

Experiment 2. A procedure similar to that described above was used to select behavioral descriptions related to kindness. In this case, the mean ratings ($n = 40$) of the items selected as kind, ambiguous, and unkind were 8.71, 4.24, and .81, respectively. Again, the standard deviation of each ambiguous item was greater than the largest standard deviation of any item in the other two groups ($SD = 2.92$).

Procedure

Except where noted, the procedures described were identical in both experiments.

Administration of the priming task. Subjects, who were run in groups of four to eight, were greeted by a male experimenter. The experimenter introduced himself as a graduate student and stated that subjects had not actually been assigned to him but that the "real" experimenter had agreed to let him pretest a word comprehension test he was trying to develop. The exercise was described as a test of how people perceive word relationships based on their first immediate impressions. The task consisted of a number of items adapted from materials developed by Costin (1969, 1975). Each item consisted of a set of four words, and the subject's task was to underline three of the words that would make a complete sentence. The subject was told to complete each item as quickly as possible. Each item listed the words in random order and was constructed in such a way that the subject could form at least two possible sentences. In Experiment 1, however, each possible sentence formed from the hostile priming items (e.g., "leg break arm his") necessarily conveyed hostility while each item formed from other (filler) items (e.g., "her found knew I") did not. In Experiment 2, the filler items were identical, but each possible sentence formed from the kind priming items (e.g., "the hug boy kiss") conveyed kindness.

Although the effects of priming were expected to increase with the number of times an instance of the trait concept was primed, a more diagnostic test of these effects was constructed by varying both the total number of items in the questionnaire and the proportion of these items that was relevant to the trait concept. Specifically, subjects completed a total of 30 or 60 items, either 20% (6 or 12 items) or 80% (24 or 48 items) of which were related to the concept being primed. (Items of each type were distributed randomly throughout the questionnaire.) The influence of the number of priming items per se would then be indicated by significant effects for both of these manipulations. Moreover, the proportion variable should have a greater effect when the total number of questionnaire items is large than when it is small.

To avoid suspicion, all subjects within any given experimental session received a questionnaire of the

same length, but the proportion of priming items was varied. In addition, the particular priming items used in constructing the questionnaire were varied, so that pooled over subjects within each condition, each item occurred the same number of times.

Presentation of stimulus materials. After completing the priming task, the graduate student thanked the subjects for helping him. They were then turned over immediately to the "real" experimenter, told to return 1 hour later, or told to return 24 hours later. (In the latter two cases, subjects had previously been notified through the mail that they were scheduled for those times as well. The early dismissal from the first session was attributed to a small mix-up that prevented one of the planned experiments from being ready on time.)

The second experimenter (a female) then led subjects to believe that the scheduled experiment consisted of three separate and unrelated tasks. The first task (the only one relevant to the present article) was described as a task of impression formation. Subjects were asked to read a short vignette about a stimulus person (Donald) that described a series of events occurring during the course of one afternoon. Two vignettes, serving as stimulus replications, were constructed for use in each experiment. Each vignette contained a different set of five behaviors that were ambiguous with respect to their implications for the primed trait. These behaviors were embedded within other information that was irrelevant to the trait. For example, one of the vignettes used in Experiment 1, which described behaviors that were ambiguous with respect to hostility, was the following.

> I ran into my old acquaintance Donald the other day, and I decided to go over and visit him, since by coincidence we took our vacations at the same time. Soon after I arrived, a salesman knocked at the door, but Donald refused to let him enter. He also told me that he was refusing to pay his rent until the landlord repaints his apartment. We talked for a while, had lunch, and then went out for a ride. We used my car, since Donald's car had broken down that morning, and he told the garage mechanic that he would have to go somewhere else if he couldn't fix his car that same day. We went to the park for about an hour and then stopped at a hardware store. I was sort of preoccupied, but Donald bought some small gadget, and then I heard him demand his money back from the sales clerk. I couldn't find what I was looking for, so we left and walked a few blocks to another store. The Red Cross had set up a stand by the door and asked us to donate blood. Donald lied by saying he had diabetes and therefore could not give blood. It's funny that I hadn't noticed it before, but when we got to the store, we found that it had gone out of business. It was getting kind of late, so I took Donald to pick up his car and we agreed to meet again as soon as possible.

Similar vignettes that were ambiguous with respect to kindness, were used in Experiment 2.

In each case, subjects were asked after reading the vignettes to form an impression of the person described and then rate him along a series of trait dimensions, six of which (hostile, unfriendly, dislikable, kind, considerate, and thoughtful) were assumed to imply either a high or a low degree of hostility/kindness, and the others of which (boring, selfish, narrow-minded, dependable, interesting, and intelligent) were expected to be evaluatively loaded but descriptively unrelated to either hostility or kindness. These ratings were made along a scale from 0 ("not at all") to 10 ("extremely") and in each case included reverse scoring on half the items.

Ratings of individual behaviors. After rating the target person, subjects rated the hostility (in Experiment 1) or kindness (in Experiment 2) conveyed by each of the 20 individual behaviors selected on the basis of the pretest data described earlier. These ratings were made along a scale from 0 ("not at all hostile/kind") to 10 ("extremely hostile/kind").

Ratings of trait co-occurrence. Finally, subjects were asked to estimate the co-occurrence of hostility (in Experiment 1) and kindness (in Experiment 2) with each of the other 11 traits. Items were of the form "If a person is hostile [kind], how likely is it that he is ———?" and were rated along a scale from 0 ("not at all") to 10 ("extremely").

Postexperimental data. To check on the extent to which subjects might have had insight into the objectives of the experiment despite the several precautions taken to dissociate the priming questionnaire from the impression-formation task, subjects in Experiment 2 were asked to indicate which of the four tasks they performed during the experimental session(s) were most likely to be related to the same hypothesis. Following this question, they were also asked to indicate any other tasks they thought might be related.

Collection of Normative Data

To facilitate the interpretation of the expected priming effects, normative data were collected on the 20 behaviors used in each experiment. To avoid possible context effects associated with the large pool of behaviors originally tested, different groups of subjects rated the amount of hostility conveyed by each behavior used in Experiment 1 ($n = 28$) and the amount of kindness conveyed by each behavior used in Experiment 2 ($n = 34$) on scales ranging from 0 ("not at all hostile/kind") to 10 ("extremely hostile/kind"). These ratings were all made under neutral testing conditions and were later used for comparative purposes.

Results

Experiment 1

Preliminary analysis. The traits *unfriendly, dislikable, kind, considerate,* and

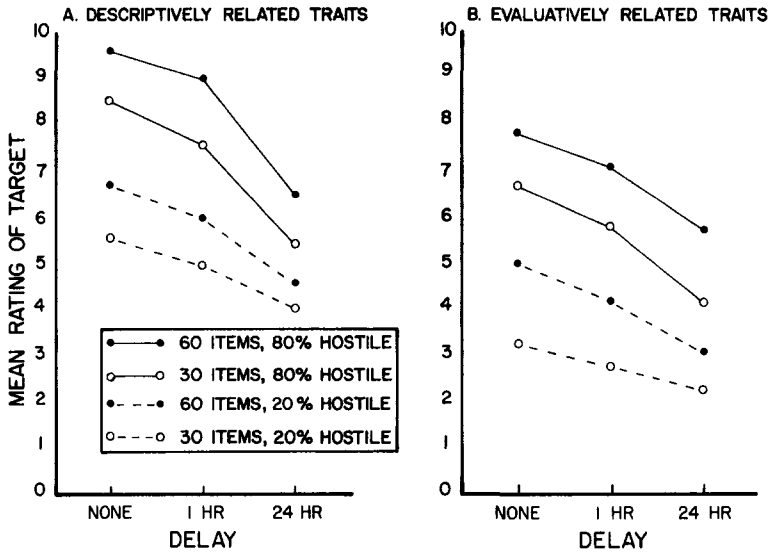

Figure 1. Mean ratings of target person along (A) descriptively and (B) evaluatively related traits to hostility as a function of questionnaire length, proportion of hostile priming items, and delay.

thoughtful were assumed to be denotatively related to the trait *hostile*. Ratings of the estimated co-occurrence of these traits with hostility, which ranged (after reverse scoring on the last three) from 8.79 to 8.98, indicate that they were all thought to covary with hostility to a substantial degree. Thus the six traits were summed across to produce a single index of the perceived hostility of the target. Similarly, ratings of the remaining six traits were summed after appropriate reverse scoring to provide a single index of the unfavorableness of the target along dimensions that are evaluatively loaded but not descriptively related to hostility, as evidenced by co-occurrence ratings ranging from 5.52 to 6.45.

Ratings of target person. Mean ratings of the target along both hostility-related dimensions and evaluative dimensions not directly related to hostility are shown in Figure 1 as a function of the length of the priming questionnaire, the proportion of hostile priming items, and the delay between completion of the priming task and presentation of the stimulus materials. Analyses as a function of these variables and the stimulus replication are relevant to several hypotheses. First, ratings of the target along both sets of dimensions were expected to increase with the number of times hostility-related concepts had previously been activated. Support for this can be seen in Figure 1, which shows that ratings of the target increased monotonically with the number of hostility-related items contained in the questionnaire. The hypothesis is supported statistically by significant main effects of both questionnaire length, $F(1, 72) = 123.74$, $p < .001$, and the proportion of hostile priming items, $F(1, 72) = 590.67$, $p < .001$. If the effect of priming is a linear function of the number of times hostility was previously primed, the effect of proportion should be greater when the questionnaire is long than when it is short. While the interaction of proportion and questionnaire length was not significant ($F < 1$), the pattern of results is consistent with predictions; specifically, when collapsed over delay conditions, the difference in the mean trait ratings of the target between low and high proportion lists was greater for the long questionnaire (2.70) than for the short questionnaire (2.51).

Second, the effect of priming was expected to decrease with the time interval between the priming task and presentation of the stimulus information to be encoded. The data shown in Figure 1 clearly support this hypothesis, which is tested statistically by the main effect

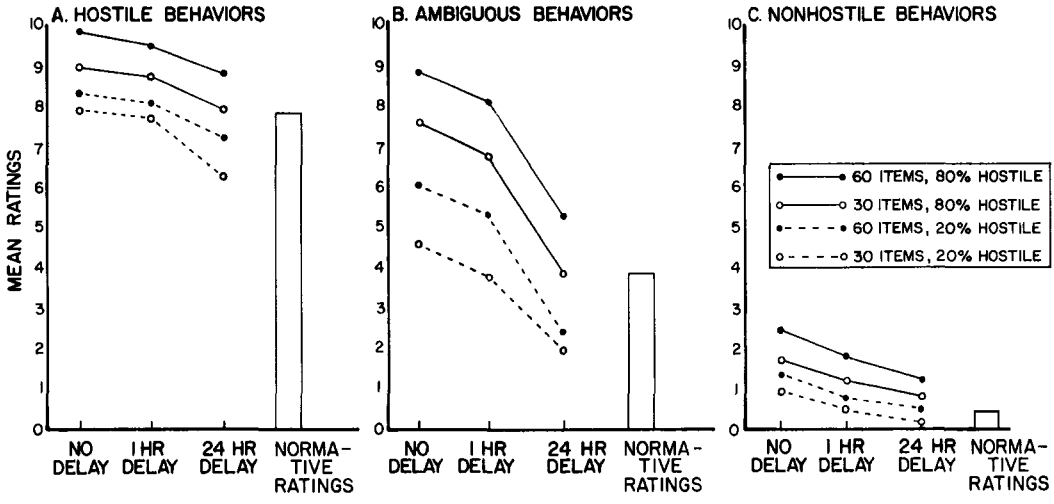

Figure 2. Mean ratings of (A) hostile, (B) ambiguous, and (C) nonhostile behaviors as a function of questionnaire length, proportion of hostile priming items, and delay.

of delay interval, $F(2, 72) = 133.32$, $p < .001$.[2] Figure 1 also suggests that the magnitude of the decrease in priming effects over time is a positive function of the number of times the category was initially activated (i.e., the number of relevant priming items in the questionnaire). Only the interaction of delay and proportion of priming items was statistically significant, $F(2, 72) = 8.30$, $p < .001$, indicating that the effect of delay increased with the proportion of priming items in the initial questionnaire. Since the number of relevant items presented differed more as a function of proportion than as a function of overall questionnaire length, the greater contingency of delay on the former variable is not surprising.

Finally, priming effects on judgments of hostility were expected to generalize to ratings along dimensions that are evaluative but related to hostility only indirectly through subjects' implicit personality theories. Data in the right panel of Figure 1 clearly support this hypothesis. However, these effects were not as pronounced as they were on judgments along dimensions that were descriptively related to the primed concept (left panel of Figure 1). This hypothesis is supported by significant interactions of trait type with both delay, $F(2, 72) = 5.13$, $p < .01$, and the proportion of hostile priming items, $F(1, 72) = 5.70$, $p < .05$. Specifically, the effect of delay interval on judgments of the target along descriptively related dimensions was greater ($M = 7.65$, 6.94, and 5.28 in the immediate, 1-hour, and 24-hour conditions, respectively) than its effect on judgments along evaluative but not descriptively related dimensions ($M = 5.77$, 5.00, and 3.90, respectively). However, the proportion of hostile priming items had less effect on hostility-related judgments ($M = 5.41$ and 7.83 under 20% and 80% conditions) than on evaluative judgments along other dimensions ($M = 3.49$ and 6.29, respectively).

Ratings of individual behaviors. The mean ratings of hostile, ambiguous, and nonhostile behaviors are plotted in Figure 2 as a function of experimental variables. Analyses of these data yielded an obviously significant effect of behavior type, along with the predicted main effects of delay, proportion of hostile priming items, and length of the priming questionnaire (in each case, $p < .001$). By far the greatest effects occurred on ratings of ambiguous behaviors, as evidenced by significant

[2] It should be noted that all of the results reported in this paper are based on analyses of variance that assume homogeneity of treatment-difference variances. The small positive bias that results when this assumption is not completely satisfied (see, e.g., Huynh & Feldt, 1970) would appear insignificant in relation to the general strength of the results.

interactions of behavior type with questionnaire length, $F(2, 144) = 65.64$, $p < .001$; proportion of hostile priming items, $F(2, 144) = 352.95$, $p < .001$; and delay, $F(4, 144) = 223.69$, $p < .001$. The 4-way interaction among these variables was also significant, $F(4, 144) = 3.38$, $p < .02$. This reflects the fact that the interaction among delay, number of priming items, and proportion of critical priming items was greater for the ambiguous behaviors than for the other two behavior types, $F(2, 72) = 4.79$, $p < .02$. In fact, this component accounts for 73.8% of the total interaction sums of squares.

The differences in ratings under the 24-hour delay conditions are sufficient to justify the conclusion that the priming task influenced judgments even after a fairly long time interval had elapsed. However, they do not indicate in an absolute sense whether the delayed ratings were positively affected by priming under all conditions. Evidence bearing on this question is provided by a comparison of these ratings with normative ratings of the behaviors made by subjects who were not exposed to the priming task. These normative ratings are also presented in Figure 2. Unfortunately, the comparisons are not easy to interpret. Subjects who completed priming questionnaires in which only 20% (6 or 12) of the items were hostility-related made *less hostile* ratings of both the hostile and ambiguous behaviors than subjects who received no priming at all. Taken at face value, this suggests that priming under these conditions had a negative effect after a delay of 24 hours. However, since comparable results did not obtain in Experiment 2 (see below) and such negative effects are difficult to account for theoretically, such a conclusion must be treated very cautiously pending replication. (Indeed, it seems more reasonable to attribute the finding to spuriously high normative ratings of the behaviors than to negative effects of priming.)

Experiment 2

Preliminary analysis. The traits *considerate, thoughtful, hostile, unfriendly,* and *dislikable* were assumed to be descriptively related to the trait *kind.* Mean estimates of the co-occurrence of these traits with kindness (after reverse scoring on the last three) ranged from 8.54 to 8.85, indicating that they were all thought to covary with kindness to a substantial degree. Ratings of the six traits were therefore summed across to produce a single index of the perceived kindness of the target. Ratings of the remaining six traits were also summed after appropriate reverse scoring to provide a single index of the perceived favorableness of the target along dimensions that are evaluatively but not descriptively related to kindness. Ratings of the estimated co-occurrence of these traits with kindness ranged from 5.69 to 6.24.

Ratings of target person. Mean ratings of the target person along dimensions both descriptively and evaluatively related to kindness are plotted in Figure 3 as a function of experimental variables. These effects are similar in most respects to those obtained in Experiment 1. The hypothesis that ratings would increase monotonically with the number of times concepts related to kindness were previously activated is supported by main effects for both questionnaire length, $F(1, 72) = 35.62$, $p < .001$, and the proportion of kind priming items in the questionnaire, $F(1, 72) = 158.67$, $p < .001$. Moreover, the effect of proportion was significantly greater when the questionnaire was long ($M = 4.54$ and 6.05 under 20% and 80% conditions) than when it was short ($M = 4.24$ and 5.18, respectively), $F(1, 72) = 8.85$, $p < .01$.

The hypothesis that priming effects would decrease over the time interval between the priming task and stimulus presentations was again strongly supported, $F(2, 72) = 47.79$, $p < .001$. Moreover, the magnitude of this decrease was greater when the proportion of kind priming items in the questionnaire was high than when it was low, $F(2, 72) = 19.66$, $p < .01$, and greater when the questionnaire was long than when it was short, $F(2, 72) = 5.98$, $p < .01$. These findings indicate that the effect of delay is a positive function of the number of times that kindness was initially primed.

Finally, the priming manipulations had very similar effects on ratings of both dimensions that are descriptively related to

kindness and those that were evaluative but descriptively unrelated. This again supports the hypothesis that once the target's behavior is encoded in terms of a trait, it will also be assigned other characteristics that are evaluatively associated with this trait. However, the effect of delay on ratings of descriptively related dimensions ($M = 5.94$, 5.15, and 4.54 in the immediate, 1-hour, and 24-hour conditions, respectively) was greater than for ratings of evaluatively related dimensions ($M = 5.23$, 4.88, and 4.29, respectively), $F(2, 72) = 3.61$, $p < .05$. Moreover, the effect of proportion was greater for descriptively related judgments ($M = 4.55$ and 5.87 under 20% and 80% conditions) than for evaluative judgments along other dimensions ($M = 4.23$ and 5.36, respectively). However, this difference was not reliable, $F(1, 72) = 1.54$, *ns*.

There are two related differences between these data and those obtained in the first experiment. First, the delay interval in Experiment 1 had an appreciable effect at all combinations of questionnaire length and proportion of critical priming items, whereas the effect of delay in the present experiment was negligible when the proportion of priming items was low, $F(2, 72) = 1.68$, *ns*. Second, the effect of the two priming variables after a 24-hour delay was pronounced in the first experiment, but was much less so in this study. In fact, neither questionnaire length ($F < 1$) nor proportion of kind priming items, $F(1, 72) = 3.12$, *ns*, had reliable effects after such a delay. In sum, these data suggest that a greater number of priming items was necessary to increase the accessibility of a schema associated with kindness than was required to increase the accessibility of a schema associated with hostility. Moreover, the accessibility of kindness-related concepts appears to decrease more rapidly over time than does the accessibility of concepts related to hostility.

Ratings of individual behaviors. Mean ratings of individual behaviors designated as kind, ambiguous, and unkind on the basis of normative data are shown in Figure 4 as a function of experimental variables. The effects of these variables are generally similar to their effects on ratings of the target person; that is, the estimated kindness of all three types of behaviors increased with both questionnaire length and the proportion of kind priming items contained in the questionnaire, each $F(1, 72) \geq 43.60$, $p < .001$, while decreasing as a function of the time interval between the priming task and making these estimates, $F(2, 72) = 51.73$, $p < .001$. Moreover, the effects of the time delay increased with both questionnaire length, $F(2, 72) = 6.75$, $p < .01$, and the proportion of kind priming items, $F(2, 72) = 25.75$,

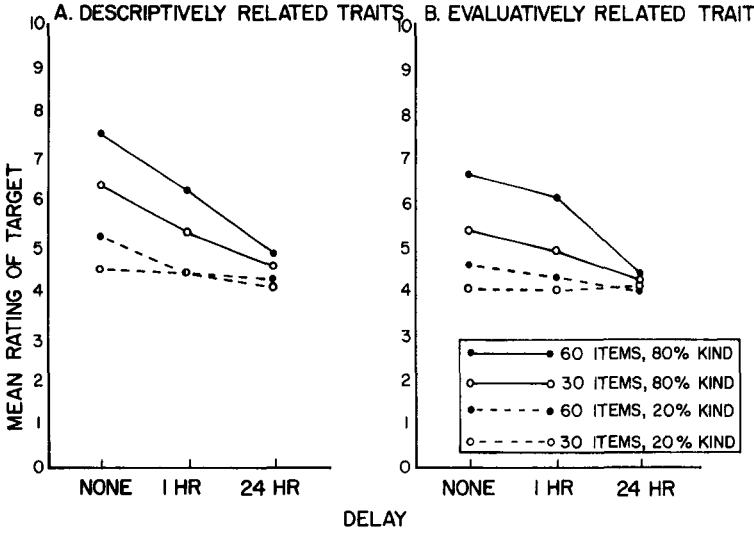

Figure 3. Mean ratings of target person along (A) descriptively and (B) evaluatively related traits to kindness as a function of questionnaire length, proportion of kind priming items, and delay.

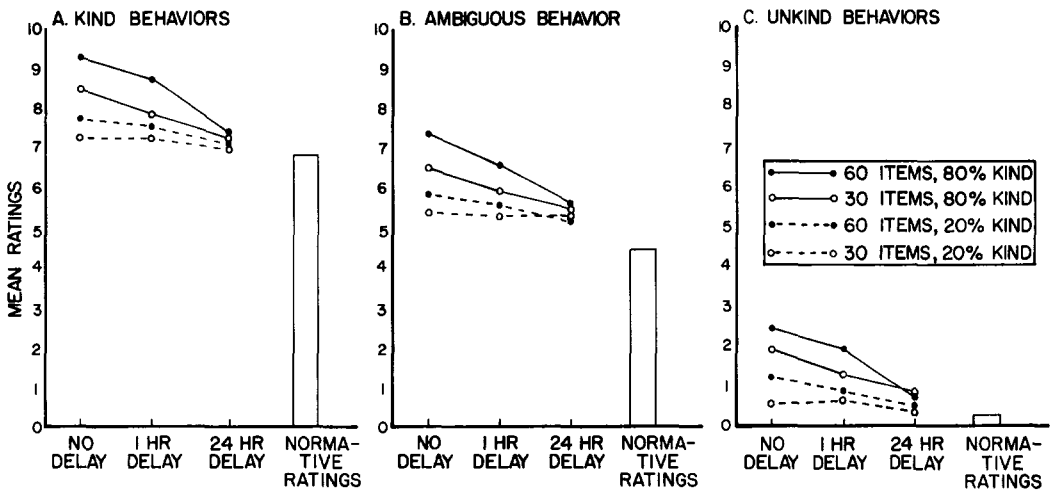

Figure 4. Mean ratings of (A) kind, (B) ambiguous, and (C) unkind behaviors as a function of questionnaire length, proportion of kind priming items, and delay.

$p < .001$. As in the case of target ratings, priming had virtually no effect when only 6 or 12 kindness-related items were involved, and the effect of priming after a 24-hour delay was negligible.

In addition to the above effects, there was an interaction between behavior type and the proportion of kind priming items, $F(2, 144) = 10.53$, $p < .001$. This interaction reflects the fact that the proportion variable had a greater effect on ratings of ambiguous items than on unambiguous ones, $F(1, 72) = 14.42$, $p < .001$. This component accounts for 74.5% of the total interaction sums of squares. Finally, there was also an interaction among behavior type, proportion of kind priming items, and delay, $F(4, 144) = 2.44$, $p < .05$, which is again attributable to the greater effect of experimental variables on ratings of ambiguous behaviors than on ratings of unambiguously kind or unkind behaviors, $F(2, 72) = 3.31$, $p < .05$. This component accounts for 73.9% of the total interaction sums of squares.

The mean normative ratings of each type of behavior under neutral conditions are also shown in Figure 4 for comparison. These ratings, unlike the corresponding ones in Experiment 1 (see Figure 2), are invariably below subjects' ratings in any one of the priming conditions. Thus, each level of priming increased the perceived kindness of all three types of behaviors. However, this effect was much less pronounced after a 24-hour delay than after either of the shorter delays.

Supplementary analysis. Despite the elaborate precautions taken to separate the priming and experimental tasks, a postexperimental questionnaire was administered to determine whether subjects had insight into their actual relatedness. Two findings suggest that subjects were not complying with any implicit demand characteristics. First, only 5 of 96 subjects thought the first (priming) task was related to any of the other three tasks performed during the course of the experimental session(s). Moreover, only 1 of these 5 connected the priming task to the subsequent impression-formation experiment. Thus, subjects were just as likely to relate the priming task to an objectively irrelevant experiment as to the ratings of actual concern. Since each of the four tasks was highly dissimilar, subjects appeared to be guessing randomly and to have no insight at all into the relationship of the two tasks.

Discussion

The two experiments reported in this paper are consistent in their implications for the processing of information about persons. Specifically, once a trait concept or schema is made more accessible by previous cognitive activity, the likelihood that the same schema will be used to encode new information is

increased. The accessibility of these concepts, and therefore the likelihood that they are subsequently used, increases with the number of times that instances of them have been activated in the past. Moreover, although these effects decrease with the time interval between their activation and the acquisition of information to be interpreted or encoded, they are sometimes detectable even after 24 hours. In addition, the effect of category accessibility on the encoding of behavioral information is much more pronounced when the implications of this information are relatively ambiguous.

Finally, once behavioral information is encoded, these encodings affect judgments of the person who manifested the behavior with respect to both the trait originally primed and other traits that are related to it only indirectly through subjects' implicit personality theories. The fact that these effects were typically less on judgments of the latter than of the former traits suggests that this generalizability is not simply due to a halo effect produced by exposure to "good" or "bad" concepts on the priming task. Moreover, this generalization process is very likely to be contingent upon the original encoding of the information about the person being judged. As Higgins et al. (1977) found, increasing the accessibility of a trait concept has little effect on later evaluations of a target person unless the concept is applicable for encoding the information about this person. Once the encoding takes place and an overall impression of the target is formed, however, it may then be used as a basis for inferring traits of the target that are unrelated to either the original behavioral information or the material in the priming task.

In combination, the present experiments and the earlier study reported by Higgins et al. suggest that category accessibility is an important mediator of social judgment processes. However, direct evidence of encoding was not obtained in the present study. Such evidence is suggested by Higgins et al., who found that only the priming of trait terms that were potentially applicable for describing the target's behavior affected subjects' later characterizations of him. Thus, primed traits that were evaluatively toned but inapplicable for describing the target's behavior had no effect. While similar data were not collected in the present study, the paradigm used is sufficiently similar to suggest tentatively that similar processes were operating.

At least two other approaches could be used to examine directly the mediating role of category accessibility and the conditions under which it affects encoding. First, reaction time procedures may be useful. For example, once a particular trait concept such as *hostile* is primed and is thus theoretically made more accessible, subjects should encode information with hostile implications more quickly, as well as be capable of making judgments based upon it more rapidly. Second, our analysis has assumed that encoding effects occur at the time the stimulus information is received. If this is true, priming trait concepts *after* presenting behavioral information about a target (i.e., after the information has already been encoded) should not have any effect on subsequent judgments of the person. Evidence that priming produces no effect under these conditions would provide clear evidence that priming effects are in fact mediated by the encoding of behavioral information.

The difference between the ultimate duration of priming effects obtained in this type of situation and those typically obtained with semantic and lexical decision-making tasks is striking. For example, the effects of priming a familiar noun category (e.g., "bread") on the time required to respond to other concepts that are closely associated with it (e.g., "butter") appear to dissipate in a matter of milliseconds (for a summary, see Schvaneveldt & Meyer, 1973). This suggests that the processes underlying these phenomena are quite different from those that underlie priming effects obtained in the experiments reported here. It also suggests that an "interference" interpretation of the sort postulated by Wyer and Srull (in press) may be more appropriate for describing the processing of complex social stimulus information than the spreading activation approach that is typically used to account for priming effects (cf. Collins & Loftus, 1975). On the other hand, the fact that the present effects

are sometimes still detectable after a period of 24 hours remains intriguing. It is possible that factors such as the experimental laboratory, the presence of the same fellow subjects, and other situational conditions provided a variety of relatively novel contextual cues that were rich enough to "reprime" the trait categories originally made salient. This possibility should also be explored in future research.

The generalizability of the main findings over experiments suggests that these effects are not unique to particular trait concepts or to traits at a given level of favorableness. The amount of priming required to activate different trait concepts appears to differ, however. In the first experiment, as few as six instances of hostile behavior were sufficient to activate the schema related to this trait and thus to affect subsequent judgments. However, many more instances of kindness were apparently required to increase the accessibility of a kindness-related schema. It is possible that this difference is due to unique characteristics of the two traits or the particular set of priming behaviors used. However, to the extent that these materials are representative of favorable and unfavorable traits, it would appear that favorable trait concepts are generally more difficult to activate using the present procedures. Impression formation research (e.g., Birnbaum, 1974; Wyer & Hinkle, 1976) has consistently shown that favorable information has less influence on judgments than unfavorable information does. One reason is that favorable information is typically more ambiguous (for direct evidence of this, see Wyer, 1974). In the present case, since favorable behaviors are socially desirable, instances of these behaviors may be considered less indicative of traits to which they correspond (cf. Jones & Davis, 1965). Therefore, when considered in isolation, these behaviors are less likely to activate a particular trait schema. This possibility may deserve further investigation using a broader sample of trait concepts than those considered in the present studies.

While the effects of manipulations of category accessibility decrease over the interval between the priming task and presentation of the information to be encoded, they appear to increase with the time interval between the presentation of this information and subsequent judgments (Higgins et al., 1977). These two effects should be distinguished. The likelihood that a trait category is accessed and used to interpret information should decrease over the time period since it was most recently activated, for reasons noted earlier. Different considerations arise in explaining the effect of a delay between the encoding of information and judgments. Immediately after exposure to the stimulus information, both the raw information and the encoded representation of it are easily accessible. To the extent that the encoding does not capture all the implications of the original information for the judgment to be made, the judgment may be based on a composite of both. However, the accessibility of the original input material may decrease more rapidly over time than the encoded representation of it, producing the increased effect of encoding reported by Higgins et al. Additional evidence of increased effects of encoding over time has been reported by Carlston (1977), and an investigation of comparable effects within the present paradigm may also be worthwhile.

A final issue to be considered concerns the way in which various target persons will be differentially affected by prior activations of a particular trait schema. The interpretation of information about persons is obviously an overdetermined process, and the accessibility of a particular trait schema is likely to be only one of several determinants. Wyer and Srull (in press) have proposed that schematic representations of specific individuals are built up on the basis of repeated experiences. In this regard, the effects of increased accessibility of a particular trait schema on the encoding of new information may be an inverse function of the amount of information already known about the target person. Thus priming effects may be most pronounced when the target person is previously unknown.

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