Memory Bias in Impression Formation

by

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Abstract

This study investigates two phenomena of person-memory. First, subjects recall more information if asked to form an impression of another person than if asked simply to remember the same information. Second, subjects remember proportionately more traits or behaviors that are incongruent with an initial description than they do congruent information. We propose a person perception model whose features include a hierarchical representation of persons to account for these two phenomena. We then tested aspects of this model in two experiments. In Experiment 1, subjects were given either impression or memory instructions and were presented behavior predicates providing information from either 1, 2, or 3 personality concepts categories. Recall increased in the Impression condition and decreased in the Memory condition in the Three concept condition compared to the One and Two concept condition. In Experiment 2, m subjects were given Impression or Memory instructions and were presented either a set of traits from a single conceptual category (i.e., social or intellectual) or homogeneous traits that included a subset of traits from a different, but not incongruent, category. Differences between recall in the Impression and Memory conditions occurred only when the lists of traits included distinct conceptional categories of personality information. Recall differences were due to both higher recall of distinct information in the Impression condition and lower recall of nondistinct information in the Memory condition. Both experiments, suggest that recall of person information is influenced by the number of distinct personality concept categories employed. Within the framework of the proposed person perception model, category fanning effects are claimed to be important in determining recall of information about persons.
Memory Bias in Impression Formation

The present study investigates two findings concerning recall of information about individual persons. The first finding, by Hamilton and his colleagues (Hamilton, Katz, & Leirer, 1980a, 1980b), is that subjects remember more behavioral information if they are instructed to form an impression than if they are told to try to remember the information. Second, Pastie and Vumer (1980) found that when presented both consistent and inconsistent information about a target person, subjects will remember proportionately more inconsistent than consistent information. Until now these two phenomena have been investigated independently of one another without a unifying theoretical framework. Here we test a model of person perception that claims that the same underlying cognitive processes are involved in both memory phenomena. To provide the rationale for our study a more detailed description of the procedures used in the Hamilton et al. (1980a, 1980b) and the Pastie and Vumer (1980) is necessary.

In the studies by Hamilton et al., the subjects' task was either described as impression formation or as a memory task. Following presentation of 12 to 15 behavior descriptions, subjects later recalled. In all experiments, subjects recalled more information in the Impression than in the Memory condition. Hamilton et al. (1980) proposed that the higher recall in the Impression formation condition was due to more effective organization and storage of the information than in the Memory condition. This seemed likely because other research has shown that more inter-item associations lead to higher recall. (For a review see: Bower, 1972; Crowder, 1976).

To investigate this hypothesis, Hamilton, Katz, and Leirer (1980) gave either impression or memory instructions and then presented subjects a series of behavior descriptions from several personality content categories (e.g., Social, Intellectual, Religious behaviors, etc.). Although these behaviors
were presented in random order, in later recall the Impression subjects clustered more according to the personality content categories than did the Memory subjects. Hamilton and Leirer (1979) hypothesized that more effective organization in the impression conditions lead to higher recall.

This hypothesis was not verified. Three types of recall bias may have produced recall different from that expected in standard verbal learning experiments (which we will consider as baseline recall). First, as thought by Hamilton and Leirer (1979), recall may have been higher than baseline in the Impression Formation condition. Second, recall may have been depressed below baseline in the Memory condition. Finally, a combination of both may have occurred.

Recently, Hamilton (1981) proposed a schema activation model of the cognitive representation of persons. Briefly, this framework claims that people have access, in memory, to a large number of personality characteristics (Hamilton calls these person schemas). For example, among these are schemas for the extrovert, the Athlete, the Intellectual, and so on. When encountering a novel target person, particular schemas are thought to be activated by the person's behaviors or other types of information. As a result of such experience the perceiver is thought to build up a unique, composite of schemas that represent the target person. The procedures by which these composites are constructed and represented are not specified. Nor are the implication of such a representation for person perception made explicit.

Let us turn now to congruity effects in person memory research. In experiments by Hastie and Kumar, 1979; Hastie and Mazure, 1979; Hastie, 1980, subjects first received an initial trait description of a person that reflected one personality content category (e.g., sociability). Next, the subjects were presented a series of behavior descriptions that included content that was congruent (e.g., sociable behaviors) and content that are incongruent
(e.g., unsociable behaviors) with the initial description. Across experimental conditions the proportion of incongruent items were varied. Finally, the subjects tried to recall the behavior descriptions.

The general findings were that for highly incongruent items, the lower the proportion of incongruent items, the more likely was their recall. When there were equal proportions of congruent and incongruent items, recall of incongruent items was either slightly better or equal to the recall of congruent items. These findings are consistent with the category cueing effects found in human learning studies (for a review see: Mandl 1967).

Fastie (1980) explained these results using two principles akin to those found in attribution theory. First is the principle that infrequent types of events are judged to be more informative than frequent events and therefore receive more attention and are encoded more elaborately. Second is the principle of degree of congruency: presumably, the more incongruent events are, the more informative they become. As a result, highly incongruent, infrequent events are salient and elaborately encoded. Elaboration at encoding is thought to yield a richly connected representation of that event in long-term memory.

The experiments reported here test a model that we use to account for the two phenomena described above. This model extends research in social and cognitive psychology and incorporates three principles. First, the model assumes that perceivers' representations of individuals includes higher order concepts. These concepts are thought to be much like personality dimensions or content categories (for reviews see: Rosenberg and Sedlak, 1972; Schneider, 1977). Second, this information about persons is organized or structured in memory (for reviews see: Mandl, 1967; Crowder, 1976). Finally, this organization may produce systematic bias leading to faulty memory (Anderson and Howie, 1973; Power, Clark, Lapsole, Winkenz, 1969; Posnigger, 1978). Our
present concern will be with the model's claims about memory biases in forming impressions.

Forming an impression is an active process in which, presumably, many common personality concepts categories are employed, as a unit, for the interpretation and storage of information about novel persons. A common set of concepts are likely to be employed by most members of a culture. Much research focuses on these common concepts and have typically been described as either personality dimensions or categories (for reviews see: Rosenberg and Sedlak, 1972; Schneider, 1973). This research finds that people use a small, common set of concepts for describing the personalities of others.

We suppose that such personality concepts are organized as cognitive schemata and employed in person perception. Information about a target person is interpreted and stored in memory according to these common personality concepts. Figures 1a, 1b, and 1c provide a graphic characterization of how person schemas might operate in representing a novel person.

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Insert Figure 1 about here
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We assume that before you meet someone ("Person A"), you have only an "empty filing card" like Figure 1a setting in memory, with pre-established personality concepts arranged as empty slots, ready to be filled with particular values for this person. In Figure 1a, we have used the five personality concepts found repeatedly by Norman (1963), namely, Extraversion, Agreeableness, Conscientiousness, Emotional-Stability, and Culture. Each concept has a positive and negative pole. We have employed these five labels as examples of concepts. We are making no claim to having identified or correctly characterized the actual concepts employed by social perceivers. Indeed, the issue of the number and correct labels for these concepts is currently debated.

Next, the model assumes that verbal and nonverbal behavior by the target
person (or reports of it by an informant) will be categorized into one or more personality traits, and that these traits can be grouped under the positive or negative roles of Norman's five personality dimensions. As an illustration, Fig. 1b shows the developing structure for Person A after the subject has learned that A did Behaviors P1 (which implies Trait T1), P3 (implying Trait T3), and P4 (implying Trait T4), and an informant also said that A had Traits T2, T5 and T6. We note that the behaviors and traits are organized into groups, hence into hierarchies. Moreover, these specific behaviors and traits are being linked into the previously empty "filing card" for Person A. The model conceives of these linkages as associations that can be strengthened by repetition and weakened by interference and disuse. The subject uses them to retrieve information about Person A from memory.

Figure 1b illustrates the case where a given situation-behavior episode implies just a single trait. Clearly, the model is general enough to accommodate multiple trait implications of a given episode. Our experiments below aim for this simplification of one episode to one trait.

Figure 1c shows how the accumulation of information about Person A leads to greater elaboration and differentiation of A in memory. We note, however, that the new information includes the belief that A is emotionally unstable, a negative connotation that conflicts with the prior positive impression (in Fig. 1b) that A was extroverted, cultured, and conscientious.

The subject uses this knowledge structure to remember what was said about Person A, and what opinion he or she came to about A. Two possible phenomena are worth noting in passing. First, through greater interference or disuse, the memories for A's behavioral episodes may be forgotten whereas the personality trait description may survive, leading to the familiar phenomenon of social informants readily describing some target's personality without being able to remember specific behavioral episodes that revealed those traits.
Later, with further loss of the lower trait information, one's memory for A may only be generally positive or negative, with no ability to recall anything more specific about A.

A second phenomenon consistent with this model is "reminding" by similarity. As we learn about Person A, we may notice that he is rather like our stereotype of the hirn-strumpf, New York intellectual: in fact, he most reminds us of Woody Allen. Such remindings are possible because our memory is already filled with stereotyped personality types--particular patterns of traits as in Figure 1b--and a large number of individuals--more specific traits and behaviors as in Figure 1c. Associative retrieval from memory follows automatically by similarity or resemblance of an input pattern to these pre-existing personality templates in memory. If a new person sufficiently resembles some specific individual we already know, we may use that pre-existing memory structure to encode the novel information. This is done, first, by copying the pre-existing trait structure (like Fig. 1c) into the filing card for Person A (deleting the behavioral episodes), and, second, by adding to this structure new, differentiating information about Person A. This copying operation causes both benefits and costs. A benefit is that you can make plausible guesses about yet-to-be-revealed characteristics of Person A (e.g., whether he will be an appealing companion). A cost is that later you may not remember exactly what was said or inferred about Person A, and you confuse him with the stereotype (or individual template) you used to encode Person A into memory. Thus, you erroneously attribute to him traits for which you never had any evidence. Both these effects are familiar in the literature on stereotyping.

In the present studies, we will be concerned with implications of this hierarchical model for specific person memories. A first implication of person memory structures like those in Figure 1c involves the principle of cue overload, or interference or "fanning". The basic idea is that the greater
the number of associative links emanating from a given node in a memory structure (e.g., different behaviors exemplifying a given trait), the lower is the probability that any particular one of these links will be retrieved and recalled. For example, in spreading activation models of retrieval (e.g., Anderson, 1976), the greater the "far" of a node, the more a given amount of search energy from that node is divided, so less activation is transmitted down each link, causing a lowered speed and probability of retrieval.

When applied within the context of person structures like Fig. 1c, the spacing principle implies poorer recall of a trait the greater the number of traits attached to that personality dimension; similarly, there should be poorer recall of a behavior from a trait the greater the number of behaviors exemplifying that trait for that person. These theorems refer to cases of obvious variations in "hit length", in amount of information presented. However, a more subtle and discriminating implication can be derived for a constant amount of material. The implication is that, within a wide range of conditions, a constant amount of information arranged in a hierarchy (like Fig. 1c) will be more retrievable the more different branches of the tree are used in organizing the information. For example, if a constant number of traits or behaviors were presented about Person A, overall memory retrieval should be poorer if all traits or behaviors refer to, say, agreeableness rather than being spread among several personality concepts, such as agreeableness, extraversion, and emotional stability. Such category set-size effects have been found for free recall of lists of taxonomic category instances (e.g., Mandler, 1967). Our person memory model expects them for personality information.

This model also explains the two phenomena described previously, the superior recall by impression-forming subjects (Hamilton et al., 1980) and of distinctive (set-breaking) traits (Mastie, 1980). Consider Mastie's results first. A typical subject would receive a large amount of trait (or
behavioral) information subsumable under one role of a personality concept like Extroversion, and a small number of traits (or behavioral) subsumable under the opposite pole, Introversion. The conditions for operation of the fanning principle are met, and it predicts greater proportionate recall of those traits or behaviors "beneath" the Introversion concept, and more so the greater the ratio of information contained "beneath" these two concept nodes. The model predicts this because the links to the top-level concept nodes from Person A (see Fig. 1a) already exist as empty slots to be filled, and can not be differentially strengthened by frequent or infrequent use. Therefore, only the subordinate links (below the level of the personality dimensions) will vary across the experimental conditions studied by Hastie et al. The model further implies that the set size effect does not require that the majority and minority traits be from two roles of one personality concept node like Extroversion-Introversion. Similar effects should be found when the minority traits come from a completely different personality concept node.

Regarding the superior recall of Impression-forming versus Memorize subjects in the Hamilton et al. (1980) experiments, the model supposes that the Impression-forming subjects call forth a pre-existing personality "card file" into which they fit the incoming trait information. On the other hand, the Memorize subjects simply treat the material as a list of unrelated words, and they set up a linked structure associating the words to a common node called LIST. Importantly, this LIST structure lacks the hierarchical organization of the pre-existing personality "file card" used by the Impression-forming subjects to encode the same set of words. Consequently, the Impression-forming subjects enjoy two advantages at recall. First, their hierarchical memory structure will exhibit less fanning overall than the simple LIST structure employed by Memorize subjects. Second, the personality structure ("filing card") provides a systematic set of retrieval cues for the Impression-forming
subject to use during recall, thus to prompt himself to recall trait or behavioral items stored "beneath" the noises of the personality scaffolding. The memorize subjects will not have a pre-designed structure for encoding the list material, although a few may notice and use their "personality filing card" for this purpose.

The two experiments that follow examine the effects on memory of the number of personality concepts employed and the relative numbers of items presented from each concept. Experiment 1 asks whether increasing the number of categories of behavioral information, while keeping its total number of behaviors constant, will increase the difference in recall between subjects given Impression instructions and those given Memory instructions. The proposed model expects such a difference. Experiment 2 asks further questions about the effects on recall of the addition of a small amount of distinctive information to person descriptions.

**Experiment 1: Number of Personality Content Categories and Recall**

In Experiment 1, subjects were given either Impression Formation or Memory instructions and were then presented a booklet containing 15 behavior descriptions reflecting either One, Two, or Three blocks of distinct personality content. After a short delay, they were asked to recall the 15 behaviors. Of interest was whether increasing the number of personality concepts would increase recall differences between subjects given Impression and Memory instructions.

In the Memory Instruction condition, where subjects are not thought to employ a person perception schema, we do not expect subjects to be able to immediately identify and classify personality concept shifts. Changes in behavior content may be quite subtle and difficult for these subjects to interpret. Such subtleties might actually act as a distractor and reduce the amount of information that is encoded and stored relative to the baseline con-
dition where all behaviors come from a single personality concept. On the other hand, personality concept changes may go unnoticed and recall will be equal to the single concept, baseline condition. Thus, memory instructions may produce either no change or a reduction in recall as the number of personality concepts increase.

The Impression Formation instructions should produce a different pattern of recall. The person perception model we have proposed claims that, as the number of personality concept categories increase, recall will increase. This follows because subjects organize and store the behaviors according to the a priori personality concept nodes. The scanning principle thus expects highest recall in the Three category condition and lowest recall in the One category condition.

Method

Subjects. Sixty high school seniors enrolled in an introductory psychology course and 70 college undergraduates enrolled in an introductory sociology course volunteered to participate in the study. Fifteen students were randomly assigned to each of the six experimental conditions.

Materials and Procedures. One half of the subjects read instructions telling them that they were involved in an Impression Formation experiment. They were informed that they would read through a booklet containing behavioral information about a person and that they should use it to form an impression. The remaining half of the subjects read instructions telling them that they were involved in a Memory experiment. They were informed that they should try to remember as much of the information in as much detail as possible.

Within each instruction condition, subjects were given one of three types of test booklets. One type of booklet described 15 behaviors reflecting the positive role of only one personality concept category. Across subjects,
three different personality concept categories (Social, Intellectual, and Proional Stability) were employed and served as replication sets. Examples of behaviors reflecting Social personality content are that the target person: "Inscribed and joked with workers," "Met a new friend at the gym," and "Listened with concern to a friend's problem." Examples of behaviors reflecting Intellectual content are: "Designed a complex computer system," "Went to the opera," and "Earned two college degrees." Examples of behaviors reflecting Proional Stability are: "Did not get upset in the traffic jam," "Was able to relax after a hard day," and "Was not bothered by a small mistake." An equal number of subjects received each category of behavior descriptions.

Subjects in the Two Category condition were presented a block of seven behaviors from one of the three described categories followed by eight from a second category. Across subjects, each behavior category was paired with every other behavior category and all behavior categories were presented as the leading and the trailing block of behaviors.

Subjects in the Three Category conditions were presented blocks of five behaviors from each of the three personality concept categories. Across subjects, each type of behavior content occurred in each of the three block positions.

Finally, regardless of the number of behavior content categories employed, the presentation order of behaviors within a content category was systematically rotated. Blocks of three behaviors occurred in each of five possible serial positions. This produced five presentation orders of each of the three lists of behaviors in each of the One, Two, and Three personality concept category conditions.

After reading either the Impression or Memory instructions, subjects read through the booklets containing one of the above described behavior lists. A tape recording instructed them to turn to the next page of their booklet
(describing a new behavior) every 10 seconds.

After reading the booklet, subjects then completed a 12 minute, unrelated and intellectually challenging judgment and reasoning task. Finally, they were given four minutes to recall in any order as many of the behaviors as possible.

Results and Discussion

Table 1 reports the percent of behaviors recalled in the One, Two, and Three concept category conditions in the Impression and Memory instruction conditions.

Insert Table 1 about here

Clearly, recall was higher in the Impression Formation conditions than in the Memory instruction conditions, with $F(1, 34) = 4.45$, $p < .001$. Furthermore, in the Impression condition more behaviors were recalled in the Three category condition than in the One and Two category conditions. In the Memory instruction condition there was a tendency to recall fewer behaviors in the Three category condition than in the One and Two category conditions. While neither of these trends were significant alone, an analysis of variance indicated a significant interaction between Instructions and Number of Categories, $F(2, 34) = 3.66$, $p < .03$. These results indicate that increasing the number of categories of information presented to subjects both increases recall in the Impression condition and decreases recall in the Memory condition.

Next, we analyzed item recall according to the serial position at which the item was presented, and some results were graphed in Figures 2 and 3. Figure 2 reports the percent of subjects recalling items in each of the 15 serial positions when One category of behaviors was presented.

Insert Figure 1 and 2 about here
The recall superiority of the Impression subjects was primarily confined to the beginning and end of the serial list. Center-list recall was about equal in the two conditions.

Figure 3 shows subjects' serial position curve when three different behavior categories were presented in blocked fashion. The Memory and Impression conditions are distinguished in two ways. First, the level of recall in the Impression condition is higher at all serial positions. Unlike the One category condition, recall does not drop in the middle portion of the curve. Second, recall in the Memory instruction condition is very low. One notable feature of both curves is the enhanced recall for the beginning item of each new category of information (serial positions 1, 6 and 11). This suggests that, to some extent, subjects recognize each new category of information.

However, there was generally a decrement in recall among the Memory instruction subjects in the Three category condition. We will give this finding more consideration in the general discussion.

Serial recall patterns in the Two category conditions were intermediate of those in the One and Three category conditions. They revealed to additional information and therefore are not shown.

Finally, one result in Experiment 1 is inconsistent with a prediction of our model. The model expected recall in the Impression and Memory conditions to be equivalent when all presented information comes from one personality category. But, we found higher recall in the Impression than in the Memory condition even in the One category condition, t(28) = 3.05, p < .005.

This effect might arise if the Impression subjects were actively comparing and internasociating the behavioral items as they were read. A second possibility is that the behavioral items are classifiable under multiple traits.

Experiment 1 used behavior predicates in an attempt to provide a reali-
tic impression formation task and to replicate earlier research in this area. Behavior predicates, however, have the disadvantage of being ambiguous personality descriptors. For example, without knowing more about a target person, some helpful behaviors might be interpreted as manipulative, or even occlusive. Although we attempted to create behavior predicates that only represented the personality content categories intended, we were surely not entirely successful. Thus, the Impression Formation subjects in the One category condition may have employed more than one personality concept category for storing the behavioral information. If so, this may have led to the higher overall recall.

Experiment 2 attempts to control for this problem by using personality trait terms for the person descriptions. Trait terms are less ambiguous personality descriptors than are behaviors. Thus, we expect subjects to organize and store trait information according to our a priori categories.

**Experiment 2: Distinctive Personality Information and Recall**

In Experiment 2, one half of the subjects were told that they were involved in an Impression formation experiment while the other half were told it was a memory experiment. One half of the subjects in each of these two groups were presented 15 traits that were either all Social or all Intellectual in concept. The remaining subjects in each instruction condition were presented either a block of three intellectual traits embedded in the middle of 12 social traits, or they were presented three social traits in the middle of 12 intellectual traits. After a two minute intervening task, all subjects were asked to recall as many of the personality traits as possible.

Experiment 2 was designed to investigate three questions. First, will a relatively small amount of distinctive information (i.e., Social traits embedded in Intellectual traits or Intellectual traits embedded in Social traits) be recalled more than when the same information is nondistinctive. This asks
whether traits from different personality concept nodes act like the distinctive "inconsistent information" in the Hastie et al., studies. Our model claims it will. Furthermore, the model claims that the initial person description used in Hastie's procedure is not necessary to produce the distinctive item effect. Rather distinctive information need only consist of information from the opposite pole of a conceptual category or be from a different conceptual category. Either should produce the distinctive item effect.

Secondly, Experiment 2 asked whether recall patterns would differ if subjects are instructed to form an impression versus remember the information. As noted, the model predicts that recall of Impression and Memory subjects will be similar for trait lists exemplifying a single conceptual category. This is because traits from a single personality concept category are claimed to be associated with one content category of the person schema, thus, making the fanning equivalent to that in a simple list structure.

Finally, we ask whether the recall differences reported by Hamilton, Katz, and Leirer (1980) resulted from an increase in the Impression Formation condition, a decrease in the Memory condition, or a combination of both. The interaction found in Experiment 1 indicates that the recall differences may result from both effects. Experiment 2 provides an opportunity to replicate this result and to determine whether the instruction induced recall effects are localized in distinctive traits, the surrounding context traits, or in both.

Method

Subjects. Eighty university undergraduates volunteered to participate as subjects and 80 participated as part of a course requirement. Twenty subjects were randomly assigned to each of the eight experimental conditions.

Materials. Thirty traits were taken from Anderson's (1964) 555 trait ai-
Objectives list. The 30 traits were all positively evaluated and approximately equal in likeableness ratings. Fifteen of these traits were selected to reflect Social personality content and 15 were selected to reflect Intellectual personality content. Within each content category, the 15 traits were randomly blocked into groups of three for a total of five blocks. Four types of stimulus lists were constructed from these blocks of traits. There were two types of non-distinctive stimulus lists. One consisted of five blocks of three Social traits (S-S-S-S-S) and the other consisted of five blocks of three Intellectual traits (I-I-I-I-I). A Latin-squares design was employed so that five different presentation orders of each of the non-distinctive stimulus lists were used across subjects.

There were two types of distinctive stimulus lists. One consisted of four blocks of Social traits, two at the beginning and two at the end, separated by one block of Intellectual traits (S-S-I-S-S). The other consisted of four blocks of Intellectual traits, separated by a block of Social traits (I-I-S-I-I). A Latin-squares design was employed to create five different presentation orders for each of the two types of distinctive trait lists. In the different presentation orders of the S-S-I-S-S lists, each of the five blocks of social traits occurred in each of the first two and last two block positions. The middle block (Block 3) of each of these lists contained a different set of three intellectual traits. Five different replication lists were constructed in this manner. The same procedure was employed to construct the I-I-S-I-I trait lists.

Procedure. Subjects were run one at a time or in small groups. They were first given one of two sets of instructions. Half the subjects were instructed that the experiment was concerned with how people form Impressions of others, that they would be presented a series of traits, and that they should form an impression of a person possessing these traits. The other subjects
were told that the experiment was concerned with Memory, that they would be presented a series of traits, and that they should try to remember the traits.

After receiving instructions, the subjects in each group received a booklet containing a Nondistinctive stimulus list, and half received a Distinctive stimulus list. An equal number of subjects received each of the four types of trait lists. All booklets contained one trait term per page and the experimenter instructed the subjects to turn to the next page of their booklet every 5 seconds.

After reading through the booklet the subjects completed a two minute, unrelated task and were then asked to write down as many of the trait terms as they could remember. They were given four minutes to complete this free recall task.

Besides using trait terms to control for interpretive ambiguity, two additional procedures were employed to determine whether subjects interpreted the stimulus material and followed instructions as intended. First, after completing the free recall task the subjects were instructed to return to pages 7, 8, and 9 of their presentation booklet (i.e., the third or middle block of traits presented) and to judge whether these traits were consistent, inconsistent, or different from the other traits in their presentation booklet. Finally, subjects in the Memory instruction condition were asked to describe the technique they used to remember the information.

Results and Discussion

Our first concern was the subject's judgments of the middle block items when these items were made distinctive. Seventy four subjects, of the 80 given Distinctive items lists, judged the items to be distinctive but not inconsistent with the surrounding blocks of traits. Two subjects rated these items as inconsistent and four subjects did not respond. Thus, it seems that our distinctiveness manipulation was successful. Secondly, we deleted from
the memory conditions the data of those subjects who claimed that they formed an impression of a person as a technique for memorizing the trait terms. This resulted in deleting 10 of the 40 subjects' data in the Distinctive Items condition and four (of 40) subjects' data in the Nondistinctive condition.

For the remaining data, Table 2 reports the percent of traits recalled in the Impression and Memory Instruction conditions when the trait lists included either Distinctive or Nondistinctive Items. In line with the model's prediction, recall in the Memory and Impression Instruction conditions did not differ when Nondistinctive trait lists were used. However, when several distinctive trait terms were included, recall differences are expected and were found in the Impression versus the Memory conditions. A three-way analysis of variance [Instructions (2) by Distinctiveness (2) by Replication Set (2)] confirmed these effects. Subjects in the Impression formation condition recalled more than those in the Memory condition, $F(1,138) = 9.05$, $p < .005$, however, this main effect was importantly qualified by its interaction with the presence or absence of Distinctive items in the trait lists, $F(1,138) = 6.11$, $p < .02$. There were no other main effects or interactions.

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Insert Table 2 about here

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While these findings support the prediction that overall recall differences would only occur when distinctive items are included in the trait lists, more specific questions were also investigated. Specifically, for Distinctive trait lists, we sought to determine the locus of the increase in recall in the Impression condition and the decrease in the Memory condition.

Our model of person memory claims that, in an impression formation task, traits made distinctive by their context will be recalled more than the same items when they were nondistinctive. This is because distinctiveness here is inversely related to fading. The relevant data to test this prediction are
The model also claims that recall of context items (traits presented in Flocks 1, 2, 4, and 5) in the Impression condition should be the same in the Distinctive and Nondistinctive lists. This is because in both lists context traits should produce nearly equal, large fans (12 or 15) traits out of a single content category node. Table 4 summarizes the recall of beginning (Flocks 1 and 2) and end block (Flocks 4 and 5) traits in the Impression and Memory conditions in the Distinctive and Nondistinctive stimulus list conditions. Table 4 shows no difference in recall of non-middle block items in Distinctive versus Nondistinctive lists for Impression-forming subjects (an a priori contrast, $F(1,138) = 0.36$, NS).

A second result shown in Table 4 is the lowered recall of non-middle block items of the Distinctive Items list when subjects received Memory instructions. A post hoc contrast indicated that this effect was significant, $F(1,138) = 4.39$, p<.05. These results suggest that the decrease in recall in the Memory Instruction condition is located among the non-middle block items. Inspection revealed that this lowered recall occurred primarily in the first two blocks of traits.
The results of Experiment 2 indicate that schemas for person perception include a number of personality concepts, that information about persons is represented in memory according to these personality content nodes, and that these cognitive schemas are subject to fading effects as are other memory representations.

The fan effect was indicated by two findings. First, there was higher recall of distinctive items in the Impression condition; these items represented a small amount of information from a distinct category. Second, among the surrounding context traits, there was no difference in recall between the Distinctive and Nondistinctive conditions in the Impression Instruction condition.

The results of Experiment 2 also replicate and provide additional facts about the lowered recall in the Memory Instruction condition when distinctive information is presented. While recall of middle-block traits is about equal in the Distinctive and Nondistinctive conditions, recall of Block 1 and 2 traits drops when distinctive information is presented. This finding suggests that the distinctive information stopped extra rehearsals of the preceding material, resulting in its lowered recall. Such depressed recall of prior items by distinctive items is a common finding in the literature on the "von Pesteroff" effect (e.g., Ellis, Determan, 196x; Tulving, 19xx). Additional research may permit further explication of this finding.

Summary and Conclusion

To summarize, we have investigated particular knowledge structures called "person schemas". The person schema representation that we have proposed is like a template through which information about a person is understood and remembered. This person schema begins as a skeletal structure, scaffold, or "filling card", devoid of any specific content about the target person. As information about the person is received, it is understood and stored according
to this structure. As information is aided to that person's schema the structure becomes unique and differentiates the target person from others that the perceiver knows.

We have investigated how the proposed structure influences the recall of information presented during impression formation. Our model proposes that the schema provides many different personality concept categories by which person information is interpreted and stored in memory.

In Experiment 1 we presented subjects with behaviors reflecting either one, two, or three personality concepts. The subjects were asked to remember the information or to use it to form an impression of a person. Recall in the Impression Formation condition increased whereas recall in the Memory condition decreased in the Three concept condition (compared to the One and Two concept conditions). In Experiment 2, subjects saw a list of traits all from a single personality concept category or a list containing in its middle a small subset of traits from a distinct personality category. Subjects again received Impression or Memory instructions. Subjects recalled an equal number of traits in the Impression and Memory conditions when given only one conceptual category of personality information. However, subjects in the Impression condition recalled more than those in the Memory condition when the list included traits from a distinct concept category. Impression-forming subjects recalled more of the distinctive information; additionally, Memory subjects recalled less of the context (non-distinctive) information.

The model helps us understand the variations in recall levels in the Impression condition as number of personality concept categories vary. These recall differences reflect the "fanning" (associative interference) effect familiar in the verbal learning literature; the greater the number of properties (traits or behaviors) attached to a given node in the hypothesized person structure, the lesser the probability of retrieving any specific one of them.
in recall. Perhaps the most puzzling aspect of our results is the decline in recall with three personality categories in the Memory condition of Experiment 1. Perhaps an explanation can be found in the literature on free recall. An early finding by Pease (1967) was that recall for unorganized word lists by memorizing subjects was greater the more inter-associated were the items, i.e., the more often an item occurred as a normative free associate to other items of the list. The general explanation is that recall of several items may cue recall of other items to which they are associated. Assuredly, the behavioral items of our One-category list would have appeared as more similar and associatively related than the behaviors of our Three-category list. Therefore, Pease's findings would have predicted better recall of our One-category list by our Memorizing subjects.

As noted earlier, our model of person memory also accounts for the results reported by Hamilton et al., (1980) and Hastie et al., (1980). In the Hamilton studies, subjects given Impression versus Memory instructions were presented behavioral information from many different personality content categories. Our model claims that use of multiple categories is an important condition for producing recall differences. When only one category was used in Exp. 2, the Impression versus Memory difference disappeared. In the Hastie, et al. studies, behavioral or trait information inconsistent with an initial person description was recalled more than consistent information. Similar stimulus materials were used in the Hastie et al. studies and our second experiment. In their experiments, subjects first received information about one personality dimension (e.g., Extraversion), then more information from that category plus some information from an evaluatively opposite personality category. The conditions for differential filling of information in memory are inherent in the design. Thus, our model would account for the Hastie results.
The proposed model has the advantage of being a relatively simple and efficient way to represent persons. Like the filing system of the Social Security Agency, our filing schema permits the representation of unlimited numbers of persons within its framework. Second, the information about persons is summarized at differing levels of abstractness. Thus, a person can be represented by abstract personality dimensions and traits as well as by concrete, behavioral acts. Third, existing findings in person memory research as well as the results reported here can be accounted for by the model. Finally, the model incorporates and extends earlier model-theoretic work in person perception and semantic memory research.

This study is an initial investigation of the person schema model that we have proposed. The schema in Fig. 1 is incomplete in that it refers only to personality traits of Person A; Other information about A would be his or her physical characteristics such as appearance, age, race, mode of dress, etc. These obviously can have a powerful modulating influence on person perception, but we do not yet have any clear idea of how to account for that influence. Rather, in our two experiment, we limited our investigation to two memory phenomena reported in the person that use only lists of personality traits or behaviors. The proposed model provides an account of both phenomena. The present study is part of our more general goal to explicate the operational characteristics of person schemas and the person perception process.
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