Person Stereotypes and Memory for People

Francis S. Bellezza
Ohio University

Gordon H. Bower
Stanford University

Snyder and Uranowitz have proposed a memory-priming mechanism by which information about a person that is normally unavailable in episodic memory is made available by the activation of a person stereotype that subsumes that information. In our two experiments subjects read a biography of Betty K, who was later labeled as either a heterosexual or a lesbian before the subjects took a recognition memory test. A signal-detection model was used to assess the effects of labeling on response bias as well as on the amount of information available in memory. Neither experiment produced any improved recognition memory for biographic information due to activation of a sexual stereotype. Both experiments found a response bias (guessing), however, acting in the direction of the label the subject received. It is concluded that at this time no clear empirical support exists for the memory-priming mechanism proposed by Snyder and Uranowitz.

In an important and influential article, Snyder and Uranowitz (1978) proposed a person-memory retrieval mechanism based on the operation of person stereotypes. According to their hypothesis previously presented information stored in memory but not available in a recognition task may become available after a person stereotype is activated. It is not necessary that this person stereotype play a role in encoding the information. So long as the information presented is relevant to the stereotype, the learner need not think of this relation at the time of presentation. This hypothesis thus goes against the encoding-specificity principle (Tulving & Thomson, 1973). Although Snyder and Uranowitz used person stereotypes as the activated structures to influence memory re-

trieval, their proposed mechanism should apply to other similarly constituted knowledge structures (Hasher & Griffin, 1978). These could include memory schemata (Bartlett, 1932; Rumelhart & Ortony, 1977), scripts (Schank & Abelson, 1977), frames (Minsky, 1975), descriptions (Norman & Bobrow, 1979), or even semantic categories of words (Bousfield, 1953).

The experimental procedure used by Snyder and Uranowitz (1978) was to present subjects a fictional biography of a woman named Betty K. This biography included a mixed description of her sexual feelings, thoughts, and behavior, each of which could be interpreted as stereotypically heterosexual or stereotypically lesbian. Immediately before taking a multiple-choice test on the information contained in the biography, subjects were told either that Betty K later adopted a heterosexual life style (heterosexual-label group) or that she later adopted a lesbian life style (lesbian-label group). Analysis of the test scores seemed to indicate that the proportion and type of errors subjects made on the test were affected by which label they received just before testing. Subjects in the heterosexual-label group made more errors on items that tested stereotypically lesbian information in the life history than did subjects in the lesbian-label group. On the other hand, this heterosexual-label group made fewer errors on items that tested heterosexual information. From these and sim-

ilar results, Snyder and Uranowitz concluded that labeling Betty K before testing enabled subjects to remember more of the type of information characterized by that label than they otherwise could remember. The authors also proposed that this pattern of responding resulted because the label activated either a heterosexual stereotype or a lesbian stereotype in the subjects. Further, they proposed that these stereotypes differentially enhanced the availability of biographic information subsumed by each stereotype and that this information would otherwise not be recognized. For example, the subjects who learned just before testing that Betty K became a lesbian were able to recognize test information from the life history that was stereotypically lesbian and that would otherwise not be recognized.

Of course the argument can be made that when the sexual stereotype is activated, it does not increase the availability of episodic information, but instead guides and biases the subject's guessing on those questions for which he or she cannot remember the specific fact being tested. According to this alternative hypothesis, no increase in strength of the episodic information previously encoded may result from the activation of the sexual stereotype; rather, the effect is due to a guessing bias induced by the stereotype.

Response Bias in Tests of Recognition

Many experimental results have been reported previously in which remembering has been enhanced by providing prompting, priming, or cuing information immediately before a test of free recall. Furthermore, in these studies the prompting information had not been presented during learning. In a paradigmatic experiment, Bahrick (1969, 1970) trained subjects on a list of word pairs; if the person failed to recall the response word to the stimulus word alone, then a prompting cue for the response would then be added. Each prompt was a word that would be likely by itself to lead to the response word in a free-association situation. Bahrick found that the presence of these prompts significantly enhanced recall performance. Similar effects have been reported using prose materials. Anderson and Pichert (1978) and Hasher

and Griffin (1978) found that providing subjects with a second plausible interpretation of a presented prose passage at the time of recall added to the recall of information from the passage.

The process by which this type of prompting enhances recall performance may actually involve the additional retrieval of target information from episodic memory (Snyder & Uranowitz, 1978; Spiro, 1980). A somewhat simpler explanation, however, involves a generation-recognition process (Anderson & Bower, 1972; Bahrick, 1969, 1970). When new information is provided at recall—either a single word or a complete theme—the subject may be able to use the new information to implicitly generate additional responses that are related to the material to be recalled. If any of these implicit responses are recognized as part of the event to be recalled, then they can be added to the overt recall. Note that these additional responses are retrieved from a second source in semantic memory and not from the memory for the to-be-remembered event. The information available about the to-be-remembered or target event is used only in the recognition process. Of course this generation-recognition process may not always be efficient. For instance, Tulving and Thomson (1973) have shown conditions under which the cuing or prompting material must be presented during learning in order for it to be effective for retrieval.

The relevance of the generation-recognition hypothesis to the Snyder and Uranowitz (1978) procedure is that it predicts that during a recognition test (in contrast to a recall test), enhanced recognition accuracy should not occur when prompting information is presented immediately before testing. This is because in a recognition test the prompted groups should not, in theory, have available a larger number of alternatives to choose from compared to a nonprompted group. Therefore their recognition memory should be equated.

Nevertheless prompting may have an effect on recognition performance, even though it does not improve accuracy of memory. Prompting may bias the subjects to choose one alternative over another when they are

uncertain of the correct response. We will review several cases in which priming information has resulted in a clear guessing bias on a recognition memory test. As a first example, Schustack and Anderson (1979) had subjects study brief biographies of famous people. The relevant biographical names were presented during both study and recognition testing, only during study, only during testing, or never presented. When the biographical name was presented only during testing, subjects had great difficulty rejecting recognition foils related to the biographical name. Correct recognition of presented information tended to be better in the condition in which the biographical name was never presented compared to when it was presented only during testing. Hence in this experiment the prompting at test strongly biased the choices of the subject on the recognition test but did not improve memory accuracy.

Using a somewhat different procedure, Sulin and Dooling (1974) presented a passage labeled as being about a famous person (Adolf Hitler) for some subjects and labeled as about a nonfamous person (Gerald Martin) for other subjects. On a recognition memory test, there were more false recognitions to information related to the famous person only for those subjects given the famous-person label. Subjects given the famous-person label also did worse in recognizing sentences presented in the passage and related to the famous person. Results similar to those of Sulin and Dooling have also been obtained by Owens, Bower, and Black (1979).

In a series of experiments designed to investigate the role of activity scripts in memory for text, Bower, Black, and Turner (1979) and Graesser, Woll, Kowalski, and Smith (1980) presented script-based stories to people and later tested their subjects' ability to recognize events presented in the stories. Based on their results these authors proposed that the recognition decisions occurred in one of two ways. The decision could be made on the basis of information stored in episodic memory regarding the specific story presented. If insufficient episodic information is available, however, then a decision may be made using generic infor-

mation available about the story, such as the fact that the story contained details about the routine of eating in a restaurant. According to this kind of decision-making procedure, any prompting that occurs during testing may affect what generic information the subject has available but should not enhance the availability of the particular episode previously presented.

The Snyder and Uranowitz (1978) Procedure

In their experiment Snyder and Uranowitz allowed subjects to organize the presented material by giving instructions emphasizing the creation of general impressions and the need to develop an integrated representation of the described person in memory. Before testing they then tried to impose a possibly different organization on the information in memory by the presentation of a paragraph labeling Betty K as heterosexual or as lesbian. The proposed effect of this alleged label-caused reorganization was to make more available in memory the information in the biography compatible with the priming information.

The guessing-bias hypothesis differs from the memory-enhancing process proposed by Snyder and Uranowitz. To anticipate this guessing objection, Snyder and Uranowitz instructed and tested subjects in three different conditions. The main group of subjects was the reconstruction group. These subjects read the life history, were given information labeling Betty K as either a heterosexual or a lesbian, and were then tested. The pattern of responding of this group exhibited the effects of sexual stereotypes on recognition performance.

A second group of subjects were the judges. This group had the task of judging which alternatives in each recognition-test item represented impending stereotypically heterosexual behavior, represented impending stereotypically lesbian behavior, or were neutral with respect to sexual behavior. These subjects had no access to Betty K's life history and had to make their judgments on the basis of their knowledge of general stereotypes. Furthermore, they were instructed not to consider whether these ste-

reotypes were an accurate reflection of reality or whether they endorsed these stereotyped ideas. The decisions of the judges were used in the data analysis to determine which items reflected stereotypically heterosexual behavior and which items reflected stereotypically lesbian behavior.

The third group of subjects was the fabrication group. As with the judges none of the subjects in this group read the Betty K biography. However, half were given the labeling information describing Betty K as a heterosexual, and half were given labeling information describing Betty K as a lesbian. They were then asked to take the multiple-choice test, being told that each question referred to factual information from an actual life history. Thus their task was not to demonstrate their abstract knowledge of general stereotypes about female sexuality but, rather, to identify concrete facts in the actual life of a specific person. When the test results from the fabrication groups were analyzed, it was found that those subjects given the heterosexual label for Betty K did not respond in a significantly different way from those subjects given the lesbian label.

The crux of the argument made by Snyder and Uranowitz against the operation of response bias in their reconstruction group was that no response bias had been demonstrated in the fabrication group, which experienced nearly the same testing procedure as the reconstruction group. Therefore Snyder and Uranowitz argued that no bias should be operating in the reconstruction group. We believe that this argument is not convincing. The fabrication group was placed in the peculiar position of having to make factual judgments on the basis of no factual knowledge, and they undoubtedly chose largely at random. It is difficult to imagine from precisely what perspective the fabrication group could carry out its task. On the other hand, although the judges did not see the Betty K life history, they had no trouble making decisions because they were asked explicitly to decide on the basis of their sexual stereotypes. We doubt if it is possible to identify what factors influenced the judgments of subjects in the reconstruction group by examining the pattern of responding in the fabrication group.

Signal-Detection Analysis

Because the memory process proposed by Snyder and Uranowitz (1978) is important for all memory theories, further evidence of its influence on memory retrieval should be sought. Therefore, our experiments attempted to replicate their findings. In addition, a different method was used to estimate the separate contributions of labeling instructions to increased availability of information in memory and to response bias. Rather than hoping to minimize response bias through instructions and the use of control groups, both accuracy of memory retrieval and response bias were measured directly for each subject, using a model of recognition memory derived from signal-detection theory (Klatzky, 1980, chap. 10).

The signal-detection model used provides a simple correction for guessing (Atkinson, Bower, and Crothers, 1965, chap. 5). For the present recognition task, the model assumes all-or-none memory for the correct answer, with biased guessing in case of no memory. For each recognition question the subject sees two alternative answers on the test, one of which was presented in the story. If the subject really remembers the correct alternative (with probability s), it is chosen. If the subject does not remember the answer (with probability $1 - s$), then he or she chooses the more lesbian of the two alternatives (with probability x). If the more lesbian alternative also happens to be the correct choice for this question, then the probability of a correct answer to the question will be $s + (1 - s)x$. The parameter s is a *memory availability* parameter and the parameter x is a *response bias* parameter. The bias parameter x can be estimated from the data by varying the types of foils (more lesbian, more heterosexual) paired with each correct answer.

If labeling at the time of memory testing makes congruent information more available in memory, as Snyder and Uranowitz (1978) proposed, then subjects provided with a lesbian label should show memory availability parameters (s) that are different in value from those obtained from subjects receiving the heterosexual label. However, the response bias parameters computed for the two

groups should be the same. On the other hand, if labeling affects response bias, then the different labels should affect the values of the response bias parameters (x), but not the s parameters reflecting the availability of congruent information in memory.

Experiment 1

Method

Materials. In the original Betty K materials, there were 17 items that were judged to have either stereotypically heterosexual or lesbian response alternatives and 19 items relating to nonsexual information. For the present experiment the critical items dealing with Betty K's sexual thoughts, feelings, and behavior were increased to 24 by adding additional information to her life history. As a critical change from Snyder and Uranowitz's (1978) material, all 24 items of sexual information could each be assigned one of four values. Thus each item had four possible alternatives, ranging from (a) the most stereotypically heterosexual to (d) the most stereotypically lesbian. These alternatives were derived from the original Betty K materials and were augmented when necessary. Two examples of such items are:

In high school Betty
  (a) went out with boys often
  (b) went out with boys occasionally
  (c) went out with a boy once
  (d) avoided going out with boys
While a member of a theater group, Betty
  (a) was physically attracted to Robert
  (b) thought that Robert was attractive
  (c) thought that Robert was interesting
  (d) thought that Robert was uninteresting

An example of a filler item using nonsexual information is:

Betty lived in the town of
  (a) Midvale
  (b) Midfield

Two life histories for Betty K (Biographies A and B) were composed by sampling response alternatives from the filler and test materials. For the 24 critical items representing information about Betty K's sexuality, either Alternative b or Alternative c was randomly sampled and incorporated into Biography A, and the other of the two alternatives was incorporated into Biography B. The only restriction imposed was that Biographies A and B each contain 12 b alternatives and 12 c alternatives. Alternative b was considered as more likely within the heterosexual stereotype and Alternative c as more likely within the lesbian stereotype. Thus each life history contained 12 pieces of information implying heterosexuality and 12 implying latent lesbianism.

Two test forms were then created for each form of the life history. If Alternative b had been incorporated into Biography A, then one test form for Biography A would contain Alternative b paired with Alternative a

as a foil for that item, and the other test form would contain Alternative c as that item's foil. If Alternative c had been incorporated into a life history, then one test form would contain Alternative c paired with Alternative b as a foil and the other test form would contain Alternative d as the foil. This procedure was used for all of the critical items incorporated into the two life histories. Therefore for the 12 heterosexual bits of information from a life history, 6 would be tested against Foil a and 6 against Foil c. Similarly for the 12 lesbian bits of information, 6 would be tested against Foil b and 6 would be tested against Foil d. In this way the number of lesbian and heterosexual items presented for study and the number of lesbian and heterosexual foils for each presented item were completely counterbalanced. The 24 sexual items in each recognition test could then be categorized as follows: 6 heterosexual items tested against more heterosexual foils, 6 heterosexual items tested against more lesbian foils, 6 lesbian items tested against more heterosexual foils, and 6 lesbian items tested against more lesbian foils. Because there were four forms of the test, each bit of information could occur in any one of the four categories of test items. For the 19 filler items, both possible alternatives appeared in each test form, but only one of the alternatives occurred in the life history seen by a particular subject.

The information was organized in the two life histories so that it followed a generally chronological order. Each life history was approximately 1,000 words long. On each test form the order of items was randomized, as was the order of alternatives within each recognition question.

Subjects. Fifty-eight students enrolled in basic psychology courses at the University of Santa Clara participated as a course requirement.

Procedure. The instructions given to the subjects before presenting Betty K's life history were those used by Snyder and Uranowitz (1978). Five minutes were then allowed for reading the life history. Approximately half of the subjects read Biography A and half Biography B. One week later all subjects were administered the recognition memory test. Immediately before testing subjects were presented a paragraph of approximately 50 words, describing Betty K's present life style as typically heterosexual or as lesbian, and were given 1 minute to think about this information. This labeling procedure was identical to that of Snyder and Uranowitz. Of the 58 subjects 29 were presented a paragraph labeling Betty K as heterosexual and the other 29 as lesbian. Approximately half of the subjects who read Biography A were given one form of the test and the rest the other form. The same was true for Biography B. Each subject then answered the two-alternative multiple-choice questions by choosing one of the two answers given for each item and then indicating his or her confidence in each choice by circling one of the digits 1, 2, or 3. A 3 meant that the subjects were "certain" of their choice and a 1 meant "not certain." The purpose of the confidence ratings was to insure that subjects gave careful consideration to each item.

Analysis. For the analysis a simple high-threshold signal-detection model was used (Atkinson et al., 1965, chap. 5; Klatzky, 1980, chap. 10). The interpretation

of the parameters from the model are as follows:

s = The availability in memory of lesbian information (lesbian-item availability).

t = The availability in memory of heterosexual information (heterosexual-item availability).

x = Lesbian bias in responding to lesbian items; that is, the probability of choosing the more lesbian alternative when the correct answer to a lesbian fact is not remembered.

y = Lesbian bias in responding to heterosexual items; the probability of choosing the more lesbian alternative when the correct answer to a heterosexual fact is not remembered.

The memory availability hypothesis predicts that subjects primed with a lesbian label for Betty K before testing should have a larger value for the s parameter than subjects primed with a heterosexual label, and subjects primed with a heterosexual label should have a larger value for the t parameter. In contrast, the pure bias hypothesis predicts that only the lesbian bias parameters x and y should be larger for subjects receiving the lesbian label than for subjects receiving the heterosexual label. Note that we have introduced two lesbian-bias parameters, when perhaps one might do for both types of items. The reason for this involves differences in subjects' guessing patterns for the two types of items and will be discussed later.

The relation between the proportion of items correct and the values of the model parameters has already been discussed in a general way. Now the proportion correct for each of the four types of items will be expressed specifically in terms of the parameters. The probability of correctly responding to an item testing for lesbian information (Alternative c) in the life history and having a more heterosexual foil (Alternative b) can be represented as

$$p(\text{correct}) = s + (1 - s)x.$$

Here s is the probability that the requested lesbian information will be remembered, and x represents the probability of choosing the more lesbian alternative when the requisite information cannot be remembered. For lesbian information presented in the story (Alternative c) but tested against a more lesbian foil (Alternative d), the probability of a correct response is

$$p(\text{correct}) = s + (1 - s)(1 - x).$$

Similarly for heterosexual information (Alternative b) tested against a more heterosexual foil (Alternative a), the probability of a correct choice is

$$p(\text{correct}) = t + (1 - t)y.$$

Here parameter t represents the memory parameter for heterosexual items, and y represents the likelihood of choosing the more lesbian alternative when the presented heterosexual information cannot be remembered. For an item representing heterosexual information (Alternative b) in the life history tested against a more lesbian foil (Alternative c), the probability of a correct choice is

$$p(\text{correct}) = t + (1 - t)(1 - y).$$

Results

All tests of significance were performed with an alpha value of .05. Table 1 shows how well each of the two groups performed on each of the four types of items.

A $2 \times 2 \times 2$ analysis of variance was performed on the proportions of correct recognition with the factors being type of pretest label provided (lesbian vs. heterosexual), type of item information tested (lesbian vs. heterosexual), and type of distractor (more lesbian vs. more heterosexual), respectively. The factor representing type of label was a between-subject factor. Type of distractor was significant, $F(1, 58) = 10.10$, $MS_e = .037$, with the items containing heterosexual distractors being recognized better than items containing lesbian distractors. The two mean proportions were .73 and .65, respectively. Except for differences in population stereotypes, it is not obvious how to explain this result. Inspection of Table 1 indicates that lesbian items with heterosexual distractors produced more correct choices than heterosexual items with lesbian distractors. Both these types of items involved Alternatives b and c, and for both types of items, subjects tended to choose Alternative c over Alternative b. The only other significant source of variation was the Type of Item $\times$ Type of Distractor interaction, $F(1, 58) = 91.98$, $MS_e = .024$. From Table 1 it can be seen that subjects were accurate when lesbian items were tested against lesbian dis-

Table 1

Mean Proportion Correct for Each Item Type by Subjects Given Different Labels in Experiment 1

Type of item	Lesbian label		Heterosexual label	
	M	SD	M	SD
LL	.72	.18	.81	.16
LH	.66	.20	.65	.16
HL	.55	.21	.52	.21
HH	.79	.16	.82	.15

Note. LL = lesbian item with lesbian foil; LH = lesbian item with heterosexual foil; HL = heterosexual item with lesbian foil; HH = heterosexual item with heterosexual foil.

tractors (Alternative c with Alternative d as a distractor) or when heterosexual items were tested against heterosexual distractors (Alternative b with Alternative a as a distractor). These results suggest that subjects avoided choosing alternatives representing the most extreme claims about behavioral frequencies (Alternatives a and d). Though such significant item effects were found, this analysis uncovered no effects due to type of labeling.

Next the parameter values computed for each subject were analyzed. Two analyses of variance were performed on the transformed data: one analysis on the availability parameters, s and t, and one analysis on the bias parameters, x and y. Each analysis contained one between-subject factor (heterosexual vs. lesbian label) and one within-subject factor (s vs. t or x vs. y). The mean parameter values for each group are presented in Table 2.

Analysis of the memory-availability parameters showed only that the grand mean, .37, was significantly different from zero, $F(1, 56) = 247.20$, $MS_e = .064$. That is, subjects remembered from episodic memory 37% of the sexual information tested from Betty's history. This amount did not differ significantly, however, for subjects receiving the heterosexual label versus the lesbian label; that is, the value of s did not differ significantly from the value of t. Subjects who were told that Betty K was a heterosexual did not remember heterosexual information about her any better than did subjects who were told that she was a lesbian. Similarly subjects given the lesbian label did not recall the lesbian information about her any better than subjects given the heterosexual label.

The analysis of the bias parameters showed that the mean value for parameter y (.72) was significantly larger than the mean value for parameter x (.40), $F(1, 56) = 97.65$, $MS_e = .032$. The reason for this difference was mentioned earlier; subjects avoided foils representing the extremes on the heterosexual–lesbian scale. So for the items testing lesbian information (Alternative c), subjects tended to choose Foil b when it was presented more than they chose Foil d when it was presented. In this case the lesbian bias was weak. But for tests of heterosexual information (Alternative b), subjects tended to choose c much more frequently than a and thus showed strong lesbian bias.

A more interesting result with regard to the main hypotheses was that the Label Group × Bias Parameter interaction was significant, $F(1, 56) = 6.32$, $MS_e = .032$. Posttests showed that the lesbian-label group showed more lesbian bias on the lesbian items (.46) than did the heterosexual-label group (.33). The two groups did not differ, however, in bias on the heterosexual items (.71 vs. .74).

Discussion

The results of Experiment 1 revealed no greater memory sensitivity to lesbian information in memory for subjects who were presented a lesbian label for Betty K than for subjects presented a heterosexual label. Similarly the heterosexual-label subjects showed no memory advantage when tested on heterosexual information. These results do not confirm the memory mechanism proposed by Snyder and Uranowitz (1978). On the other hand, some response bias was found. This effect means that the activation of a sexual stereotype before testing memory had the effect of biasing guessing when no information could be remembered relevant to the item being tested.

The results of Experiment 1 did not provide strong support for either the availability hypothesis or the bias hypothesis. Perhaps

Table 2
Mean Values for the Parameters for Subjects Presented the Lesbian or Heterosexual Label in Experiment 1

Parameter	Lesbian label		Heterosexual label	
	M	SD	M	SD
Memory availability				
s	.38	.25	.45	.22
t	.31	.28	.34	.29
Response bias				
x	.46	.28	.33	.24
y	.71	.24	.74	.19

the experimental manipulations were not strong enough to create the desired differences in memory enhancement or bias. In an attempt to produce greater differences in parameter values between the two labeling groups, the salience and emphasis on the labeling instructions were augmented in Experiment 2.

Experiment 2

Method

Subjects. Seventy subjects from the introductory psychology courses at Ohio University participated for extra course credit.

Materials and procedure. The materials and procedure were the same as used in Experiment 1, except for the labeling manipulation. One week after reading a Betty K life history and immediately before testing, half of the subjects read the paragraph labeling Betty K as a heterosexual, and half read the paragraph labeling her as a lesbian. After reading the paragraph each subject wrote answers to four questions about Betty K. The subjects for whom Betty K was labeled as heterosexual were given the questions listed below. The subjects for whom Betty K was labeled as a lesbian read "adopt a homosexual life style" rather than "eventually marry" in Questions 1 and 2.

1. When you were reading Betty's history, did you believe that Betty would eventually marry (adopt a homosexual life style)?
2. How many specific instances can you remember from Betty's history that indicated that she would eventually marry (adopt a homosexual life style)?
3. What percentage of women with Betty's type of background do you think are able to adopt a life style that they find satisfying?
4. List the three events in Betty's life that you believe were the most important in forming her later personal values and attitudes.

These four prompts were included as an attempt to increase the effects of the labeling manipulation on the later recognition memory test. The subjects were given 5 minutes to read the labeling paragraph and answer the four questions. They then completed the multiple-choice recognition test.

Results

Table 3 shows the mean proportion of items correctly recognized for each of the four item types. As in Experiment 1 a three-factor analysis of variance was performed on the proportion correct; the factors were type of label provided at testing (lesbian vs.

Table 3

Mean Proportion Correct for Each Item Type by Subjects Given Different Labels in Experiment 2

Type of item	Lesbian label		Heterosexual label	
	M	SD	M	SD
LL	.66	.22	.74	.18
LH	.65	.19	.60	.18
HL	.55	.16	.53	.16
HH	.83	.17	.78	.14

Note. LL = lesbian item with lesbian foil; LH = lesbian item with heterosexual foil; HL = heterosexual item with lesbian foil; HH = heterosexual item with heterosexual foil.

heterosexual), type of item information tested (lesbian vs. heterosexual), and type of item distractor (more lesbian vs. more heterosexual). The results obtained were very similar to those obtained in Experiment 1. Type of distractor was significant, $F(1, 68) = 20.04$, $MS_e = .033$, with items containing heterosexual distractors being recognized better than items containing lesbian distractors. The two means were .72 and .62, respectively. The only other significant source of variation was the Type of Item $\times$ Type of Distractor interaction, $F(1, 68) = 74.91$, $MS_e = .028$. As in Experiment 1 this result indicates that in general the subjects avoided choosing alternatives representing the more extreme forms of behavior (Alternatives a and d). Again no effects were found for type of labeling at testing.

The mean values for parameters s, t, x and y are displayed in Table 4. The same analyses were performed on these parameter values as described for Experiment 1. The mean of s and t combined, representing the availability of information in memory, was .34, which was significantly greater than zero, $F(1, 68) = 221.42$, $MS_e = .064$. That is, for 34% of the items, subjects could remember the requested information. As in Experiment 1 no other sources of variation were significant in the analysis of these memory parameters. In contrast, significant differences occurred between the two labeling groups in the bias parameters. The bias toward choosing a lesbian alternative was

Table 4
Mean Values for Parameters for Subjects Presented the Lesbian or Heterosexual Label in Experiment 2

	Lesbian label		Heterosexual label	
Parameter	*M*	*SD*	*M*	*SD*
Memory availability				
s	.32	.28	.33	.23
t	.39	.24	.32	.24
Response bias				
x	.49	.28	.39	.25
y	.77	.21	.70	.16

greater for subjects who were told that Betty was a lesbian (.63) than it was for subjects who were told that she was a heterosexual (.54), $F(1, 68) = 4.47$, $MS_e = .058$. The bias was consistent with the direction of the label. Finally, as in Experiment 1 the value for parameter *y* (.74) was significantly larger than the value for parameter *x* (.49), $F(1, 68) = 66.19$, $MS_e = .048$. That is, subjects avoided choosing the extreme alternatives on the heterosexual–lesbian scale.

General Discussion

In these experiments subjects remembered a significant amount of information related to the sex-relevant thoughts, feelings, and behaviors of a fictional woman named Betty K. Using an all-or-none memory model of recognition, we estimated that 37% of this information was remembered in Experiment 1 and 34% in Experiment 2. In neither experiment, however, was there any evidence that subjects better remembered the information about Betty K that was congruent with the sexual stereotype ascribed to her just before testing. We were unable to detect any priming or enhanced availability of information from episodic memory resulting from the activation of the stereotype. Thus we failed to confirm the type of retrieval mechanism proposed by Snyder and Uranowitz (1978).

In contrast to this negative finding on

memory, we did obtain evidence that the stereotype label influenced subjects' response bias in both experiments. Activation of the stereotype appeared to bias guessing in a congruent manner when information about a particular item could not be remembered. In Experiment 1 this bias occurred only for items testing lesbian information in the life history, but in Experiment 2 this bias occurred for both lesbian and heterosexual information. These results indicate that such a response bias may also have been operating in the Snyder and Uranowitz (1978) experiment because the procedures for collecting data in their experiment and in the two experiments reported here were very similar. The arguments of Snyder and Uranowitz against the operation of reponse bias were based on the finding that the subjects in their fabrication condition did not show response bias. They therefore assumed that response bias was not operating in their reconstruction group. The present findings indicate that that assumption may have been wrong.

In general, the results of these experiments support the memory schema models of Bower et al. (1979) and Graesser et al. (1980), which include no mechanism for retrieving additional information from memory when schemata are activated. There is, of course, the possibility that the memory complex itself can be affected by new information presented during the learning session or during the retention interval. The resulting accommodation that takes place in the memory complex can have predictable effects on later free-recall performance (Spiro, 1980). However, assimilation-and-reconstruction seems not to have been important in these recognition experiments.

Snyder and Uranowitz (1978) have proposed that information concerning a person may be reorganized in memory as new information is processed that is incompatible with the existing representation of that person. Others have emphasized just the opposite process, however—the persistence of beliefs about an individual, even after information supporting those beliefs has been discredited. This effect has been labeled the *perseverance effect* (Ross, Lepper, Strack, & Steinmetz, 1977). Further research is needed to determine the conditions under

which reorganization rather than perseveration of organized memory structures may take place.

We suggest that the type of analysis used here, in which separate measures of the availability of information in memory and the effects of directed guessing can be computed, is one that should be used more frequently in memory research involving schematic knowledge structures such as person prototypes. Separating the effects on performance of actually remembering specific information about an event, as opposed to guessing by inferring what probably was true given other general information available in memory, is a difficult task for memory researchers. The type of analysis proposed here may make this task easier.

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