When Are Social Judgments Made? Evidence for the Spontaneousness of Trait Inferences

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Do people make trait inferences, even without intentions or instructions, at the encoding stage of processing behavioral information? Tulving's encoding specificity paradigm (Tulving & Thomson, 1973) was adapted for two recall experiments. Under memory instructions only, subjects read sentences describing people performing actions that implied traits. Later, subjects recalled each sentence under one of three cuing conditions: (a) a dispositional cue (e.g., generous), (b) a strong, nondispositional semantic associate to an important sentence word; or (c) no cue. Recall was best when cued by the disposition words. Subjects were unaware of having made trait inferences. Interpreted in terms of encoding specificity, these results indicate that subjects unintentionally made trait inferences at encoding. This suggests that attributions may be made spontaneously, as part of the routine comprehension of social events.

Although research on social inferences has dominated social psychology for well over a decade, the lion’s share of scientific attention has centered on inferences made in response to explicit instructions. But as several researchers have recently pointed out (Berscheid, Fraziano, Monson, & Dermer, 1976; Pyszczynski & Greenberg, 1981; Wong & Weiner, 1981), there is little research on whether and when such inferences occur spontaneously. This issue of whether and when social inferences are initiated in the absence of investigators’ instructions is important in its own right and has serious import for research in social cognition. The spontaneousness of these inferences largely determines their frequency outside the laboratory and is therefore crucial to any claim regarding their psychological importance.

Early researchers in person perception and impression formation (e.g., Asch, 1946; Tagiuri, 1958) expressed complete confidence that the phenomena they studied were not only spontaneous but pervasive and central to everyday psychological functioning. For example, Asch wrote in 1946,

We look at a person and immediately a certain impression of his character forms itself in us. A glance, a few spoken words are sufficient to tell us a story about a highly complex matter. We know that such impressions form with remarkable rapidity and great ease. Subsequent observations may enrich or upset our first view, but we can no more prevent its rapid growth than we can avoid perceiving a given visual object or hearing a melody. (Asch, 1946, p. 258).

In a marked contrast, more recent person perception research has at least implicitly characterized social judgments as deliberate, even laborious mental operations, performed under particular and unusual conditions. These conditions include having a mental set induced by experimental instruction (e.g., Enzle & Schopflocher, 1978) or a need to feel in control (e.g., Berscheid et al., 1976). Underlying this research is the assumption that making attributions is always a discrete mental operation, easily separable from other stages in the information-processing sequence, and that it is an optional stage that is engaged only
under special circumstances (e.g., Pryor & Kriss, 1977, with regard to causal attributions). Indeed, authors who discuss person perception in terms of an explicit processing sequence (e.g., Schneider, Hastorf, & Ellsworth, 1979, chap. 1) commonly identify trait attributions as a relatively late stage, dependent on the outcome of several earlier operations performed on the behavioral information.

This characterization may have unwittingly arisen from the kinds of paradigms that attribution researchers have used most heavily. In these paradigms, subjects are presented with all the information necessary to make judgments and are instructed to carry out the specified mental operation. Clearly, an inference or trait attribution may occur deliberately, at the instigation of experimental instructions or with some other particular purpose in mind, or be based on previously encoded information that has been retrieved from memory. We wish to point out, however, that many researchers seem to have assumed that social judgments outside the laboratory share the cognitive characteristics of these laboratory judgments, that is, they require intention and effort and represent a later, optional processing step.

A few recent researchers, working in the conceptual framework of information processing, have discussed the possibility that attributions are as spontaneous as early theorists like Asch posited. The notion that attributional phenomena are an integral part of the process of encoding information, rather than a separate mental operation occurring at retrieval, was raised by Smith and Miller (1979), who proposed that attributional processing is “intrinsically involved in the initial comprehension of sentences and therefore that it goes on all the time, not just when a subject is asked an attributional question” (1979, p. 2247). Similarly, Carlston (1980) considered the effects of spontaneous inference making on subsequent memories for behavior and impressions.

The present research was a direct test of the possibility that inferences about personality can be part and parcel of the encoding of behavioral information, carried out without instructions or other unusual motivating conditions (i.e., spontaneously). Although this does not imply that trait inferences must always be spontaneous, or that they must always occur at encoding, a demonstration that trait inferences may also occur spontaneously at encoding would strongly suggest that they are ordinarily an integral part of the process of observing behavior and not essentially discrete operations motivated by particular purposes and dependent on information retrieval. Our basic proposal is that people sometimes make spontaneous social inferences as part of their initial comprehension of social information. Even without explicit questions or goals, they do not simply store some representation of the information as it is presented. Instead, they make inferences and store both the information and their inferences in memory.

To test the notion that trait inferences ordinarily are made at encoding, we adapted the encoding specificity paradigm developed by Tulving and his associates (Thomson & Tulving, 1970; Tulving & Osler, 1968; Tulving & Pearstone, 1966; Tulving & Thomson, 1973). The encoding specificity principle holds that “specific encoding operations performed on what is perceived determine what is stored, and what is stored determines what retrieval cues are effective in providing access to what is stored” (Tulving & Thomson, 1973, p. 369). The principle stresses “the importance of encoding events at the time of input as the primary determinant of the storage format and retrievability of information in the episodic memory system . . .” (Tulving, 1972, p. 392). Thus, an effective retrieval cue for any input will be another piece of information that was encoded at the same time. Cue effectiveness is defined as “the probability of recall of the target item in the presence of a discrete retrieval cue” (Tulving & Thomson, 1973, p. 354) and is determined by comparison with the free-recall rate (i.e., noncued recall).

In encoding specificity experiments, target words like chair are paired with weak semantic associates, such as glue. Subjects study lists of such pairs with the expectation that their memory for the target words will be tested. They are then asked to recall the target words in the presence of either the input cue (glue), a strong semantic associate of the target (e.g., table), or no cue. Tulving's results (e.g., Thomson & Tulving, 1970) showed that recall was best when the input cue was present, whereas recall cued by the strong semantic associate was in fact no better than noncued recall.
If people make trait inferences when they observe behavior and encode the information, those inferred traits should be stored in memory along with the information on which they were based. Therefore, as part of the encoding context of the behavioral information, the attributed trait itself should serve as a self-generated covert input cue and thus as an effective retrieval cue for the behavioral information. It should be possible, then, to show that people make trait inferences at encoding by demonstrating the retrieval effectiveness for the behavioral information of subjects’ most likely trait inference. For instance, if reading “The librarian carries the old woman’s groceries across the street,” subjects infer that the librarian is helpful, then the word *helpful* ought to be a good retrieval cue for the sentence.

Disposition cues were selected that were related to the sentences primarily by the subjects’ inferences. This was done so that the disposition words would be unlikely to cue the sentences because of some association in semantic memory. Tulving’s (1972) distinction between episodic and semantic memory is heuristic here. Tulving defined episodic memory as the memory organization “concerned with storage and retrieval of temporally dated episodes or events, and temporal-spatial relations among these events” (1972, p. 385), events such as stimuli presented in a memory experiment. This was contrasted with semantic memory, the organized knowledge of symbols and concepts. Tulving’s distinction has generated considerable controversy, chiefly surrounding the issue of separate memory stores for the two kinds of information (e.g., Anderson & Ross, 1980). The present use of the distinction as a conceptual heuristic is designed primarily as a fruitful new way of viewing person-perception issues. It does not provide a test of the notion of separate episodic and semantic memory stores. In the present research, the inferred disposition *helpful* and the librarian sentence would be associated episodically, because the subject has made the inference *(helpful)* at the time she or he encoded the sentence. *Helpful* would thus become the de facto input cue, even though not physically present at encoding and not a strong semantic associate.

The retrieval effectiveness of the disposition cues was defined by comparison with noncued recall and was also compared with the effectiveness of strong semantic associates to important sentence parts (e.g., books, a strong associate to librarian, and bags, a strong associate to carries the groceries). The retrieval effectiveness of such semantic associations has been established in verbal-learning research. This “extralist cuing effect” has been explained from a variety of conceptual frameworks (e.g., Bilodeau & Blick, 1965; Bahrick, 1969, 1970; Tulving & Thomson, 1973). These semantic associates were included as a control for the possibility that the retrieval effectiveness of the disposition words might be due to a priori semantic associations to sentence words rather than to dispositional inferences. Sets of strong associates to actors or predicates were derived in free-association tests. Our purpose was to pit the disposition cues against another set of cues that empirically had strong semantic associations with the sentences. If the disposition cues facilitate sentence recall merely because of associative contiguity with sentences, one would expect the semantic cues to produce stronger recall, because those a priori relations are empirically very strong, whereas the a priori associations between disposition words and sentences are extremely weak. But if the disposition cues were as effective as, or more effective than the strong semantic associates, this strength must be due to the episodic link between sentence and cue, that is, to their temporal cooccurrence and consequent proximity in episodic memory organization.

We can thus posit that the strongest link between the sentences and the disposition words is provided by an inference made by the subject at encoding, rather than by a priori semantic associations between the dispositions and sentences. The association between the sentence words and the disposition words is provided by episodic memory. Whatever link exists in semantic memory between disposition cues and sentences must be weaker than that between the sentences and semantic cues, because the disposition cues do not show up in the free-association pretests, whereas the semantic cues do.

Hence, the semantic and disposition cues are hypothesized to facilitate recall for different reasons. The semantic cues are closely associated with the semantic representations of the words that constitute the sentences. Presenting
subjects with the semantic associate during the recall phase should facilitate retrieval of the target sentence parts on the basis of the extralist cuing effect (cf. Tulving & Thomson, 1973). The encoding-specific cue (the inferred disposition), by contrast, is hypothesized to facilitate retrieval primarily because of the inferred trait's close episodic relation to the target information. Therefore, presenting subjects with the encoding-specific cue should provide access to the whole target sentence even though there is little or no semantic association between cues and sentence parts. The sentences and their corresponding semantic and disposition cues are presented in Table 1.

This research comprised two phases, construction of the stimuli and the recall experiments. Each experiment presented subjects with behavior descriptions that were to be recalled later in the presence either of (a) a personality attribute of the actor implied by the described action, (b) a semantic associate to one of the words of the sentence, or (c) no cue. Stimuli with the appropriate specifications were established through six pretests. Short declarative sentences were written that described simple actions in behavioral, non-evaluative terms, avoiding implications about actors' intentions, traits, attitudes, or feelings. Accordingly, verbs like helps were avoided in favor of phrases that described only the behavior (e.g., "... carried the groceries across the street"). No inferences were provided explicitly for the subject (see Table 1).

Development of Sentence Stimuli

Pretest 1: Semantic associates to actors. The first pretest was conducted to gather semantic word association norms to a large number of common nouns that could represent the actors in sentences. One-hundred eight undergraduates enrolled in social psychology and personality courses at New York University (NYU) were given pamphlets containing a list of 80 occupations and roles (e.g., architect, brother), preceded by instructions to look at each and write the first word it made them think of, avoiding the words man and woman. To determine the strongest associate to each, the responses were tallied and the most frequently given response was selected as the semantic associate. Fifteen nouns that generated more than 25% dispositional attributions as associates (e.g., nurse: kind) were excluded. Of the remaining 65 nouns, the 39 with the strongest consensus on their semantic associates were selected for use as actors in the sentence stimuli. Sentences were constructed by pairing the 39 nouns with sentence stems describing actions, half positive, half negative. Actors and sentence stems were matched in such a way that subjects and predicates were neither bizarre or striking in combination, nor redundant in terms of the information they contained. For example, pairing businessman with the stem "doubles his investment in a business venture" was avoided as redundant, because a cue like thrifty is an associate of each.

Pretest 2: Sentences evoking dispositional attributions. This pretest was designed to identify those sentences that most reliably generated dispositional attributions to the actors, rather than situational attributions. Forty-four female undergraduates taking the introductory psychology course at NYU were asked to read the sentences and make causal attributions for each. Their instructions were to "... make a judgment about what probably caused the event—why it probably occurred, given the minimal information you have. A phrase or short sentence should be sufficient." A subject's response received a score of 1 if it was judged to be totally dispositional (e.g., "she is a helpful person"), 2 if it evoked a person-centered cause (e.g., "she felt sorry for the old woman"), 3 if it evoked situational considerations ("the old woman dropped her groceries"), or 4 if it was totally situational. We calculated an average rating for each sentence, ranging from 1 to 4 with a 1 indicating unanimous dispositional attributions and 4 indicating unanimous situational attributions. Two independent judges made attribution ratings for a set of 20 responses selected at random. The interjudge reliability was found to be .89, and the first judge's scoring was followed. We chose the 18 sentences that scored closest to the dispositional end of the scale. The mean attribution rating was 1.71, and they ranged from 1.25 to 2.23 (see Table 1).

Pretest 3: Dispositions inferred from whole sentences. The personality traits most frequently attributed to actors, in subjects' own
Table 1
Sentence Stimuli, Their Cues, and Characteristics

<table>
<thead>
<tr>
<th>Sentences</th>
<th>Semantic cues&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Disposition cues&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Attribution rating&lt;sup&gt;c&lt;/sup&gt;</th>
<th>Vividness rating&lt;sup&gt;d&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>The plumber slips an extra $50 into his wife’s purse.</td>
<td>pipes <em>(28)</em></td>
<td>generous <em>(25)</em></td>
<td>2.23</td>
<td>3.55</td>
</tr>
<tr>
<td>The receptionist steps in front of the old man in line.</td>
<td>telephone <em>(21)</em></td>
<td>rude <em>(18)</em></td>
<td>1.81</td>
<td>3.45</td>
</tr>
<tr>
<td>The electrician <em>gets a promotion</em> and a raise.</td>
<td>wires <em>(37)</em> work <em>(17)</em></td>
<td>good worker <em>(18)</em></td>
<td>1.59</td>
<td>2.77</td>
</tr>
<tr>
<td>The librarian <em>carries the old woman’s groceries</em> across the street.</td>
<td>books <em>(49)</em> bag <em>(17)</em></td>
<td>helpful <em>(10)</em></td>
<td>1.78</td>
<td>3.18</td>
</tr>
<tr>
<td>The tailor picks his teeth during dinner at the fancy restaurant.</td>
<td>clothes <em>(16)</em></td>
<td>ill-mannered <em>(25)</em></td>
<td>1.59</td>
<td>3.78</td>
</tr>
<tr>
<td>The elevator-operator <em>saves enough money</em> to buy a new house.</td>
<td>floors <em>(13)</em> bank <em>(17)</em></td>
<td>thrifty <em>(13)</em></td>
<td>1.71</td>
<td>2.84</td>
</tr>
<tr>
<td>Mother <em>gets her poem into the New Yorker.</em></td>
<td>father <em>(20)</em> writes <em>(14)</em></td>
<td>talented <em>(13)</em></td>
<td>1.30</td>
<td>4.17</td>
</tr>
<tr>
<td>The farmer <em>paints a swastika on the synagogue wall.</em></td>
<td>crops <em>(10)</em> colors <em>(19)</em></td>
<td>bigot <em>(05)</em></td>
<td>1.62</td>
<td>4.61</td>
</tr>
<tr>
<td>The professor <em>has his new neighbors over for dinner.</em></td>
<td>teacher <em>(14)</em> party <em>(32)</em></td>
<td>friendly <em>(60)</em></td>
<td>1.25</td>
<td>2.19</td>
</tr>
<tr>
<td>The butcher writes a letter to the editor about air pollution.</td>
<td>meat <em>(44)</em></td>
<td>concerned citizen <em>(55)</em></td>
<td>1.69</td>
<td>2.94</td>
</tr>
<tr>
<td>The pianist leaves her purse on the subway seat.</td>
<td>music <em>(13)</em></td>
<td>absent-minded <em>(38)</em></td>
<td>1.76</td>
<td>3.13</td>
</tr>
<tr>
<td>The accountant <em>takes the orphans to the circus.</em></td>
<td>numbers <em>(16)</em> fun <em>(16)</em></td>
<td>kindhearted <em>(25)</em></td>
<td>1.71</td>
<td>3.66</td>
</tr>
<tr>
<td>The successful film-maker gives his ailing mother $10 a month.</td>
<td>movie <em>(21)</em></td>
<td>cheap <em>(43)</em></td>
<td>2.08</td>
<td>1.91</td>
</tr>
<tr>
<td>The secretary <em>solves the mystery half-way through the book.</em></td>
<td>type-writer <em>(19)</em> detective <em>(22)</em></td>
<td>clever <em>(23)</em></td>
<td>1.27</td>
<td>3.24</td>
</tr>
<tr>
<td>The sailor leaves his wife with 20 pounds of laundry.</td>
<td>sea <em>(20)</em> wash <em>(13)</em></td>
<td>inconsiderate <em>(28)</em></td>
<td>1.79</td>
<td>2.69</td>
</tr>
<tr>
<td>The barber <em>loses 20 lbs. in 6 weeks on a new diet.</em></td>
<td>hair <em>(45)</em> fat <em>(21)</em></td>
<td>willpower <em>(25)</em></td>
<td>2.14</td>
<td>3.5</td>
</tr>
<tr>
<td>The carpenter <em>stops his car and motions the pedestrians to cross.</em></td>
<td>wood <em>(24)</em> brakes <em>(15)</em></td>
<td>considerate <em>(23)</em></td>
<td>1.79</td>
<td>2.62</td>
</tr>
<tr>
<td>The reporter <em>steps on his girlfriend’s feet as they foxtrot.</em></td>
<td>newspaper <em>(21)</em> ouch <em>(15)</em></td>
<td>clumsy <em>(43)</em></td>
<td>1.71</td>
<td>1.68</td>
</tr>
</tbody>
</table>

<sup>a</sup> The italicized portion served as stimuli in the pretest for Experiment 2, obtaining semantic associations to verbs.<br><sup>b</sup> Semantic cues, actor, came from Pretest 1; semantic cues, verb, came from the pretest for Experiment 2; and disposition cues came from Pretest 3. Numbers in parentheses indicate the percentage of subjects who gave the response.<br><sup>c</sup> Attribution ratings, Pretest 2; 1 = dispositional, 4 = situational.<br><sup>d</sup> Vividness ratings, Pretest 6.
words, were obtained in this pretest. For each of the 18 sentences, 40 additional female undergraduates in the introductory psychology course answered the question, "What kind of person is this?" They were asked to write as many as three words, if that many came to mind. We tallied each response and then selected the most frequently given word as the dispositional cue for that sentence, in the same way that the most frequently given semantic associate in Pretest 1 had been selected as the semantic cue for each sentence.

Pretest 4: Dispositional associates of other noun phrases. We conducted this pretest to ensure that sentence nouns that had not already been pretested (e.g., in prepositional phrases) were not associated with dispositional concepts. The purpose of detecting such a priori relations was to rule out the possibility that the disposition words might accidentally cue sentences on the basis of semantic relations, rather than the hypothesized episodic memory connection provided by the personality inference. Sentence actors with dispositional associates had already been eliminated in Pretest 1.

Twenty-five NYU undergraduates received booklets containing 37 items (direct and indirect objects, and prepositional phrases), listed in random order, with instructions to write the first word(s) that came to mind on the line following each item. The responses for each item were recorded and tallied. No item generated more than 10% disposition concepts, and so no sentences were eliminated.

Pretest 5: Behavioral associates of dispositions. This was a further attempt to detect a priori associations between the dispositions identified in Pretest 3 and the sentence stimuli. It was done to rule out the possibility that the disposition words might accidentally cue sentences on the basis of semantic relations, rather than the hypothesized episodic memory connection provided by the personality inference. Sentence actors with dispositional associates had already been eliminated in Pretest 1.

Twenty-seven NYU undergraduates were asked "what kinds of behaviors or actions do you associate with" each of 11 dispositions. The dispositions were listed in alphabetical order and were the strongest associates from Pretest 3, where they had been given by at least 25% of the subjects. Subjects listed up to five behavioral associates of each disposition.

The dispositions elicited between 2.8 and 3.4 behavioral associates per subject. None of these were identical to or paraphrases of the sentences that had elicited the dispositions. More lenient scoring criteria showed that an average of only 5.5% (and a maximum less than 17%) of the behavior associates produced to each disposition were in the same general class of behaviors as the sentence behaviors (e.g., "looses something" for sentence 11, Table 1). Therefore, none of the sentences were eliminated on the basis of this pretest.

As a further check that disposition cues were not facilitating recall through semantic associations to behaviors, the frequencies of the leniently scored behavioral associates for each cue were subsequently correlated with the sentence recall scores for each of these 11 dispositional cues from Experiment 1. These behavior-associate frequencies were unrelated to disposition-cued recall (r = -.06, n = 11, p > .25).

Pretest 6: Vividness. The purpose of this pretest was to rule out the possibility that the vividness or strikingness of some sentences could affect their memorability, because this would confound the effect of dispositional judgment on recall for sentences. Each sentence was read by 40 additional undergraduates in the introductory psychology course, who were asked to rate each sentence on how unusual or striking each event seemed on a 5-point scale, with a 1 indicating an ordinary event and a 5 indicating a highly striking or extraordinary event. We calculated the average vividness rating for each sentence. Each block of sentences in Experiment 1 was then composed of sentences whose average vividness ratings were approximately equal to each other. The sentences' ratings ranged from 1.68 to 3.78, but the blocks' average ratings fell between 1.98 and 2.46 (see Table 1).

Experiment 1

Method

Subjects. Ninety male and female undergraduates enrolled in the introductory psychology course at NYU participated in the experiment in partial fulfillment of a course requirement. They were tested in groups of 2 to 12, and sessions lasted about 30 min.

Materials. The 18 sentences were presented one at a time by a Kodak Carousel Slide Projector. In addition, there were three slides containing a distractor task, with
instructions on one slide and three anagrams on each of the other two slides. After the slide presentation, each subject received a recall sheet containing the recall cues, on which responses were to be written. There were three kinds of cues on each sheet, counterbalanced across sentence blocks. Thus, one-third of the subjects had a particular six-sentence block cued by semantic cues, another block cued by disposition cues, and the last by no cue. There were three groups of subjects that differed only in the type of cue they received for each block of sentences. A postrecall questionnaire followed the recall sheets, for the last 60 subjects tested.

Procedure. Following Tulving’s procedure (e.g., Tulving & Thomson, 1973), written instructions informed subjects that they were participating in a memory experiment. They were asked to study the sentences carefully because they would be tested on them later. Subjects viewed each of the other two slides. After the slide presentation, each subject was shown two slides, three anagrams on each. Subjects were allowed 1 min for each slide. The recall sheets were then distributed. Subjects were allowed 10 min to recall as many sentences and as much of each as they could.

After the recall sheets were collected, the first 30 subjects were informally questioned about their recollection of the mental operations they had used (a) as they read the sentences and (b) later as they tried to recall them. Their responses helped to clarify which questions could profitably be asked and the best wording to use. On the basis of this, a postrecall questionnaire was constructed, and these questionnaires were given to the last 60 subjects tested. The first question was open-ended, asking whether they had used any method or strategy to remember the sentences and if so to describe it briefly. The second question presented them with four plausible strategies for committing the sentences to memory (visual imagery, judgments about causality, judgments about personality, and word-meaning associations) and asked them to estimate the percentage of the time they had used each. The third question explained the three cue conditions and asked them to rate how heavily they had relied on each type of cue (word-meaning or personality trait) or had applied cues of their own, by using 11-point scales to indicate their answers.

Results and Discussion

Each sentence had a similar four-part structure, generally consisting of actor (A), verb (V), direct or indirect object (O) and a prepositional phrase or second object (P). One point was given for recall of each of the four parts. Thus the maximum score for one sentence was four points. Because there were 18 sentences, the highest possible score a subject could receive was 72. We used lenient scoring. No consideration was given for verbatim recall or spelling. Credit was given for appropriate recall of consistent sentence parts: That is, when subjects responded to the cue bag with “The farmer carries the old woman’s groceries,” they received credit for recall of verb and object but not for actor recall (because the appropriate actor was the librarian). We also used this scoring practice for noncued recall when occasional words were erroneously recalled as parts of the wrong sentence. The first five recall protocols in each condition were scored by two independent coders. The interrater agreement was 96.4%.

We assessed the hypothesis that recall cued by dispositional words would be at least as strong as semantic-cued recall and superior to noncued recall by using a split-plot factorial analysis of variance (ANOVA). On the recall sheets, three blocks of sentences had been rotated through the three cuing conditions in a Latin square. Hence, block-cue pairing was a 3-level between-subjects factor. Type of cue was a 3-level within-subjects factor, as all subjects received all three types of cues. The other within-subjects factor was the sentence part recalled, a 4-level factor (A, V, O, and P). This yielded a $3 \times 3 \times 4$ (Pairing X Cue Type X Sentence Part) ANOVA.

The analysis revealed significant main effects for cue type, $F(2, 168) = 23.00, p < .001$ and for sentence part, $F(3, 252) = 12.40, p < .001$. The interaction between cue type and sentence part was also significant, $F(6, 504 = 67.65, p < .001$.

The mean recall rates of the three types of cues were ordered as predicted. Mean recall with the dispositional cue was strongest ($2.42$), followed by recall with the semantic cue ($2.14$) and by noncued recall ($1.36$). The significance of these differences was assessed by using Newman-Keuls multiple comparison tests (Kirk, 1968), which use a step-stair approach to the error rate, according to which the critical value for differences between means varies with the number of means in a set. This test showed that recall cued with dispositional words was significantly stronger than noncued recall, $W(.01) = .97$, and nonsignificantly stronger than recall with the semantic cues. Semantic-cued recall was also significantly stronger than noncued recall, $W(.01) = .644$.

The main effect for sentence part was revealed by a Newman-Keuls test to be due to the superiority of actor recall ($2.12$) to that of
preposition (1.88) and Verb (1.90) recall, $W(.01) = .23$ and .21.

The significant Cue $\times$ Sentence Part interaction is depicted in Figure 1. Analyses of simple main effects within each cue type showed that sentence parts were differentially recalled for the semantic cue, $F(3, 258) = 74.05, p < .001$, and for the disposition cue, $F(3, 258) = 22.91, p < .001$, but not for noncued recall. For semantic-cued recall, protected $t$ tests (Cohen & Cohen, 1975) showed actors to be more often recalled than verbs, objects, and prepositions, $t_{(86)} > 8.55, ps < .001$, and prepositions to be recalled less often than verbs and objects, $t_{(86)} > 2.78, ps < .001$. For disposition-cued recall, protected $t$ tests showed actors were recalled less often than verbs, objects, and prepositions, $t_{(86)} > 4.23, ps < .001$, and objects were recalled more often than verbs or prepositions, $t_{(86)} > 2.39, ps < .02$.

We computed another set of simple main effects and protected $t$ tests in order to compare recall of each sentence part in the three cuing conditions. Actors were recalled differentially by cue type, $F(2, 172) = 41.52, p < .001$. Semantic cues were more effective for actors than disposition cues, $F(2, 172) = 4.90, p < .001$, which were in turn more effective than no cues, $t(86) = 4.92, p < .001$. As Figure 1 suggests, this is a different ordering than that for the other three sentence parts across cue conditions. The simple main effects for verbs, objects and prepositions were also significant, $F_{(2, 172)} > 20.35, ps < .001$; and for each sentence part, disposition-cued recall was greater than semantic-cued recall, $t_{(86)} > 3.46, ps < .001$, which was in turn greater than noncued recall, $t_{(86)} > 1.99, ps < .05$.

In summary, as Figure 1 suggests, both disposition- and semantic-cued recall were superior to noncued recall but not different from each other overall. The disposition cues' effectiveness was greatest for sentence verbs, objects, and prepositions, whereas the semantic cues' effectiveness was greatest for sentence actors.

We also tallied the combination of sentence parts that were recalled primarily to examine differences in the kinds of sentence information each type of cue had retrieved best. We tabulated the recall for each of the 15 possible combinations of parts (e.g. actor, actor + verb). These sums are presented in Table 2. Inspection of this table reveals, first, that sentence recall overall was primarily due to recall of total sentences rather than sentence parts, and secondarily to recall of predicates. These observations were confirmed by the results of a $3 \times 3 \times 15$ (Block-Cue Pairing X Cue Type X Combination of Parts) split-plot ANOVA. It showed significant main effects for cue type, $F(2, 168) = 22.92, p < .001$; for combination, $F(14, 1176) = 188.17, p < .001$; and for the interaction between these two within-subject factors, $F(28, 2352) = 13.34, p < .001$. Newman-Keuls tests were computed between all pairs of means involved in the main effect for combination of parts. They showed that this main effect occurred because the recall of the total sentence (AVOP) was stronger than that of any other sentence-part combination, $W(.01)$ from .389 to .583; and the recall of the VOP combination (i.e., the predicate) was stronger than any other combination except AVOP, $W(.01)$ from .40 to .60.

Another theoretically interesting comparison lies in the difference in actor recall among the three cuing conditions. Inspection of Table 2 suggests that semantic cues retrieved actors best. This was supported by a test for simple main effects and found to be significant, $F(2, 172) = 63.54, p < .001$. Protected $t$ tests on the differences between pairs of means showed semantic-cued recall to be higher than either disposition-cued, $t_{(86)} = 8.98, p < .001$, or noncued recall, $t_{(86)} = 7.36, p < .001$, and noncued recall to be superior to disposition-cued recall, $t_{(86)} = 3.51, p < .001$. We con-
Table 2
Recall Frequency of Combinations of Sentence Parts As a Function of Cue Type

<table>
<thead>
<tr>
<th>Recalled combination</th>
<th>Study 1 (N = 87)</th>
<th>Study 2 (N = 63)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actor association</td>
<td>Disposition</td>
</tr>
<tr>
<td>Actor (A)</td>
<td>101</td>
<td>3</td>
</tr>
<tr>
<td>Verb (V)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Object (O)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Preposition (P)</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>A + V</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>A + O</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A + P</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>V + O</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>V + P</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>O + P</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>A + V + O</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>A + V + P</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>A + O + P</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>V + O + P</td>
<td>6</td>
<td>43</td>
</tr>
<tr>
<td>A + V + O + P</td>
<td>138</td>
<td>149</td>
</tr>
</tbody>
</table>

Note. To obtain cell means referred to in the text, compute \( (F \times P)/N \), where \( F \) is the frequency above; \( P \) = the number of sentence parts in the combination (1 to 4); and \( N \) = the sample size.

We conducted another test for simple main effects on recall of the VOP combination (the predicate) among the three cuing conditions. This was found to be significant, \( F(2, 172) = 15.92, p < .001 \). Protected \( t \) tests revealed the disposition cue to be more effective than either the semantic cue, \( t(86) = 5.35, p < .001 \), or no cue, \( t(86) = 2.27, p = .026 \). Noncued recall was also superior to semantic-cued recall, \( t(86) = 3.69, p < .001 \).

In summary, as Table 2 suggests, the most frequently recalled combination of sentence parts was the whole sentence, for which both the disposition and the semantic cues were more effective than no cue. The entire predicate (VOP) was also frequently recalled, most often with disposition cues. And actors alone were most frequently cued by semantic cues.

The question of subjects' awareness of making social judgments was assessed in several ways. The first 30 subjects were questioned informally about their recollections of having made personality-related or cause-related inferences as they read the sentences. Although demand characteristics would predict that subjects in such situations would strive to be agreeable and confirm the experimenter's suggestions, most subjects regretfully reported having made no such judgments at all. Even after the debriefing, some did not believe they had made trait inferences and were greatly surprised by evidence supplied by their own recall sheets that trait cues had actually been effective in promoting their recall.

For the remaining 60 subjects, the formal postrecall questionnaire was employed to assess introspective awareness. Alternative memory and recall strategies were described equally plausibly, since Nisbett and Wilson (1977) have pointed out that the a priori causal theories people use to explain events are preeminently those that seem plausible. The four strategies were (a) visual imagery, (b) association to word meanings, (c) judgments about causality, and (d) judgments about personality. Subjects were asked to estimate the percentage of time they had used each.

To the open-ended question, virtually no subjects reported having made causal- or personality-related judgments, and only 10 mentioned anything at all about the persons in the sentences. The mean percentage of time sub-
Table 3
Pearson Product-Moment Correlations Between Introspective Reports of Dispositional Inferences and Actual Disposition-Cued Recall Measures

<table>
<thead>
<tr>
<th>Measures</th>
<th>Experiment 1</th>
<th></th>
<th></th>
<th>Experiment 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Score</td>
<td>Ratio</td>
<td></td>
<td>Score</td>
<td>Ratio</td>
</tr>
<tr>
<td>Mention of persons on open-ended question</td>
<td>.16 (P = .21)</td>
<td>.13 (P = .32)</td>
<td>.10 (P = .43)</td>
<td>.01 (P = .93)</td>
<td></td>
</tr>
<tr>
<td>Reported thoughts about causality during encoding</td>
<td>.20 (P = .13)</td>
<td>.24 (P = .06)</td>
<td>.15 (P = .23)</td>
<td>-.03 (P = .82)</td>
<td></td>
</tr>
<tr>
<td>Reported thoughts about personality during encoding</td>
<td>.13 (P = .31)</td>
<td>.10 (P = .46)</td>
<td>-.12 (P = .34)</td>
<td>.12 (P = .36)</td>
<td></td>
</tr>
<tr>
<td>Reported usefulness of disposition cues during recall</td>
<td>.13 (P = .31)</td>
<td>.12 (P = .34)</td>
<td>-.10 (P = .45)</td>
<td>-.07 (P = .60)</td>
<td></td>
</tr>
</tbody>
</table>

jects reported using each strategy were as follows: 36.5% for visual imagery, 18.3% for causality-related thoughts, 36.6% for personality-related thoughts, and 45.5% for word-meaning associations.

To assess the question of introspective awareness more precisely, Pearson product-moment correlations were computed between self-reports and actual recall scores. In addition to the scores, we calculated for each subject the ratio of the disposition-cued recall score to the total recall score. This was taken as an additional index of the retrieval effectiveness of the disposition cues. For example, if a subject had a total recall score of 20 and had recalled 10 items (i.e., parts of sentences) that were cued with the disposition cues, his or her ratio would be .5. Both the disposition-cued scores and the ratios were correlated with the self-reports.

Table 3 presents the Pearson product-moment correlations between the two indices of disposition-cued recall and the four self-reports of having made dispositional or causal inferences during encoding (i.e., while reading the sentences) or during recall. Only one coefficient approaches significance (\(r = -.24, p = .06\)), and this is in the opposite direction from that predicted by introspective awareness. So there is no evidence that subjects were aware of having made personality inferences while encoding the behavioral information or aware of the effectiveness of disposition cues during retrieval.

Experiment 2

One criticism that may be leveled at Experiment 1 is that semantic-cued recall may have been unfairly matched against disposition-cued recall because the semantic cue was an associate of only the actor, and actors had been chosen specifically for their semantic independence from the rest of the sentence. Dispositions, although not strong semantic associates of any of the sentence parts, might still be preferentially relevant to the other major syntactic division of the sentence, the predicate. Because the predicates comprised three parts and the actors only one, disposition cues may have been superior in recall only because they were relevant to a larger portion of each sentence. Indeed, there is evidence that semantic and disposition cues retrieved sentence parts differentially, as Table 2 shows. Of the sentences recalled through semantic cues, 37% consisted of the actor alone, and 3% the predicate only. Disposition cues retrieved actors alone only 1% of the time, and predicate parts alone 26% of the time. Free recall fell between these two, with 12% actors alone and 24% predicates alone.

We conducted Experiment 2 to meet this criticism by pitting disposition-cued recall against recall cued by strong associates to the sentence verbs.

Method

Pretest: Semantic associates to verbs. The verbs or verb phrases of the 18 sentences used in Experiment 1 were shown to 40 subjects enrolled in the introductory psychology course at NYU. (These words are italicized in Table 1). Instructions were to read each word or phrase and write the first word that came to mind. Verb phrases were used in most cases because the verb alone was often too general or ambiguous (e.g., "gets" in "gets a promotion"). Thus most of these prompts were short phrases.

The strongest associates to six of the verb phrases turned out to be dispositions (e.g., "slips money into purse" yielded
the associate generous). These six sentences were dropped from the set, and Experiment 2 therefore employed 12 sentences. The verb associates were used as the semantic cues for the second recall experiment.

Recall experiment. Sixty-three students enrolled in the introductory psychology course at NYU served as subjects. They were given general memory instructions and then shown the 12 sentences on slides, presented in one of three previously fixed random orders, for 5 s each. The original 2-min distractor task followed the sentence presentation. Subjects then received the recall sheets, which provided the disposition cues (from Experiment 1) for four sentence, the new semantic associates to another four, and no cue for the third block of four. These cues were counterbalanced, as in Experiment 1. Subjects were allowed 10 min to recall the sentences.

Results and Discussion

We scored recall, as in Experiment 1, for a maximum of four points per sentence, one for each of the four parts (i.e., actor, verb, object, and preposition or second object). Because there were 12 sentences, the highest possible score was 48. As in Experiment 1, we computed a split-plot factorial ANOVA on the recall scores, with block cue pairing a three-level between-subjects factor, cue type a three-level within-subjects factor, and sentence part a four-level within-subjects factor. Both cue type, F(2, 120) = 5.35, p = .006, and sentence part, F(2, 180) = 2.86, p = .038, produced significant main effects, and the interaction between these factors was also significant, F(6, 360) = 4.41, p < .001.

As in Experiment 1, mean disposition-cued recall was highest (1.66), followed by semantic-cued recall (1.22) and noncued recall (1.13). A Newman-Keuls test showed that disposition-cued recall was significantly stronger than either semantic-cued recall, W(.01) = .25, or noncued recall, W(.01) = .22. Semantic-cued recall was nonsignificantly higher than noncued recall.

A Newman-Keuls tests on the Sentence-Part factor showed none of the sentence parts to be significantly superior to any other.

The interaction between cue type and sentence part is depicted in Figure 1. Analyses of simple main effects within each cue type revealed that sentence parts were differentially recalled for disposition-cued recall, F(3, 186) = 5.26, p = .002, and noncued recall, F(3, 186) = 4.33, p = .006. For disposition-cued recall, protected t tests showed that actors were recalled less often than either verb, t(62) = 2.23, p = .03, or object, t(62) = 3.32, p = .001, and object recall was better than preposition recall, t(62) = 2.41, p = .019. For noncued recall, protected t tests showed only a significant superiority of actor recall over preposition recall, t(62) = 2.88, p = .005.

We computed another set of simple main effects within sentence part, comparing the three cue types. Differences in actor recall for the three cuing conditions were not significant. Recall of the verbs was affected by cue type, F(2, 124) = 5.45, p = .005, with disposition cues superior to both semantic cues, t(62) = 2.09, p = .04, and no cue, t(62) = 3.06, p = .003. Recall of objects and prepositions showed the same pattern, Fs(2, 124) > 7.09, ps < .001, with disposition cues stronger than both semantic cues and no cue, t(62) > 2.94, ps < .005.

Hence disposition cues were more effective than other cues overall, and they were also more effective for each part of the predicate, despite the semantic cues being strong associates to words in the predicates.

As in Experiment 1, we also examined the pattern of sentence recall by computing recall for each combination of sentence parts. The sums in each category are presented on the right in Table 2. A split-plot factorial ANOVA on these data revealed significant main effects for cue type, F(2, 120) = 4.34, p < .05, and combination of parts, F(14, 840) = 88.32, p < .001, as well as a Cue Type X Combination interaction, F(28, 1680) = 2.05, p < .01. A Newman-Keuls test revealed that disposition-cued recall (M = .44) was superior to both semantic-cued (M = .34), W(.05) = .09, and noncued recall (M = .31), W(.05) = .11.

We also evaluated the main effect for combination of parts by using a Newman-Keuls test. This revealed that recall of the total sentence (AVOP) was superior to that of any other combination of sentence parts, W(.01) from .36 to .54 and that recall of the VOP combination (the predicate) was also stronger than recall of any other combination except AVOP, W(.01) from .27 to .46. Hence the whole sentence was most frequently recalled, followed by the predicate alone.

These recall-pattern data afford an opportunity to examine more closely the central issue of whether the disposition cues are linked to sentences via an inference made at encoding or are merely another kind of semantic association to action descriptions. If their re-
triability superiority is due to an encoding mechanism, they should be more associated to actors than the verb associates, as well as to predicates, and thus be more effective in eliciting whole sentences and combinations of sentences that include the actor. If on the other hand, they are really just semantic associations, they should produce a pattern of sentence-part retrieval, which resembles that of the verb associates. Specifically, their superiority should reside primarily in their ability to elicit predicates.

One line of reasoning, then, involves the extent to which total sentences (AVOP) were recalled by the three cue types. Evaluated by a test of simple main effects, the effect of cue type on AVOP recall was found to be marginally significant, \( F(2, 124) = 2.72, p = .07 \), and protected \( t \) tests revealed that disposition-cued recall was superior to semantic-cued, \( t(62) = 2.00, p = .05 \), and marginally superior to noncued recall, \( t(62) = 1.95, p = .056 \).

We pursued this question further by grouping together the sentence-part combinations that included the actor (i.e., actor, AV, AO, AP, AVO, AVP, AOP, AVOP) and comparing the three cuing conditions in their ability to retrieve these. Again, if trait inferences were made at encoding, the ascribed trait should become associated with the actor as well as with the predicate. So the disposition cues should be stronger than the verb associates in retrieving these actor-included combinations. Assessed by a test of simple main effects, this prediction was confirmed, \( F(2, 124) = 3.77, p = .026 \). The disposition words (M = 5.40) were stronger retrieval cues for these combinations than either the verb-associated semantic cues (M = 3.83), \( t(62) = 2.45, p = .017 \), or noncued recall (M = 3.81), \( t(62) = 224, p = .029 \). These findings support the notion that the disposition cues, more than the verb associates, were associated with actors.

A second implication of the encoding-inference notion is that the overall recall effectiveness of disposition cues should not be due to their superiority in retrieving predicates. Accordingly, predicate recall (VOP) was assessed by a test of simple main effects, which showed that VOP recall did not differ across cuing conditions. We also grouped together the sentence-part combinations that best represented recall of the predicates, those combinations that excluded the actor (i.e., V, O, P, VO, VP, OP, VOP). A test of simple main effects revealed no differences among the three cuing conditions in the extent to which they retrieved these predicate combinations, \( F(2, 124) = 2.02, p = .137 \). Furthermore, disposition-cued recall of these predicate combinations was not significantly better than verb-associate-cued recall, \( t(62) = .55, p = .587 \). Hence, the superiority of the disposition cues does not seem to reside in their ability to retrieve predicates. This indicates that they were not just more effective semantic associates to descriptions of actions.

We again assessed the question of introspective awareness by using the postrecall questionnaire from Experiment 1. On the open-ended question, virtually no one mentioned having had personality-related thoughts, and only four subjects reported any thoughts about the actors at all. As in the previous experiment, most self-reports dealt with the use of visual imagery. The same correlations were computed between responses to the four self-report questions and the two indices of actual disposition-cued recall, (i.e., subjects’ scores and the ratios of disposition-cued to total recall score). The results are shown in Table 3. None of the correlations in this experiment even approached significance.

**General Discussion**

In both experiments, recall of sentences was at least as good with dispositional cues as with either type of strong semantic cue and clearly

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1 A third line of reasoning concerns the total-sentence recall (AVOP) and addresses the possibility that AVOP recall may be an artifact of predicate recall. If the disposition cue is truly working on episodic rather than semantic relations among sentence parts, the frequency with which actor and predicate were recalled, versus predicate alone (VOP), should be greatest in the disposition cue condition. We accordingly examined the difference between the number of instances of AVOP recall and of VOP recall in the three cuing conditions (AVOP-VOP) and found it to be 46 in the disposition condition, 36 in the noncued condition, and 34 in the verb-associate semantic condition. In other words, taking the frequency of predicate recall as a baseline figure, the greatest increase in instances of actor-recall (i.e., AVOP) occurred in the disposition cue condition. The increase in instances of recalled AVOP above VOP recall was in fact slightly worse in the semantic-cue condition than in the noncued recall condition. These results are consistent with the prediction that a trait ascription to the actor was made at encoding and is associated episodically with the stored sentence.
superior to noncued recall. Yet subjects had not been instructed to make dispositional inferences and seemed unaware of having done so. Thus, the results of the experiments provide evidence that personality inferences may occur in the absence of any particular purpose such as a prediction or a requirement to follow an experimenter's instructions.

How well do these results support the notion that personality inferences are made spontaneously from behavioral information as it is encoded? This question may be rephrased in terms of how well we have ruled out the possibility that a disposition cue like helpful may be effective in retrieval if it was not present at encoding. Two major alternatives to the encoding specificity hypothesis present themselves as explanations for the retrieval effectiveness of the disposition words. One is that the disposition cues were actually functioning as semantic associates to sentences, rather than representing outcomes of an encoding-specific inference. The second concerns the locus of the hypothesized inference in the information-processing sequence: Might an inference have occurred at some later stage?

First, are there undetected a priori semantic associations between the disposition cues and the sentences that are strong enough to retrieve the sentences better than the intended semantic associates did? We designed the extensive pretesting to reduce this possibility. Even though pretesting did not identify these disposition words as semantic associates, it is still possible that such associations existed and operated to help subjects retrieve sentences. But if the disposition words were operating as semantic associates, then their effectiveness should have been specific to sentence parts. For instance, had the entire recall advantage of the disposition words resided in the recall of predicates, then it could be argued that the disposition words were merely associated with kinds of behavior in subjects' implicit personality theories (e.g., motioning pedestrians to cross the street is an instance of considerateness). The superiority of the disposition-cued recall might then be accounted for by rival theories of retrieval. For example, according to the generation-recognition theory (e.g., Bahrick, 1969), presentation of a disposition cue might allow subjects to generate a set of behaviors that exemplify the disposition and then to recognize the correct one. (We designed Pretest 5 to minimize this possibility). But in fact the disposition words had an advantage over other retrieval cues in the recall of the entire sentence and combinations of sentence parts that included the semantically unrelated actor. Most telling is the difference between disposition-cued and semantic-cued recall of these combinations in Experiment 2. In that study, both cues related in different ways to sentence verbs; the semantic cues were related by virtue of a priori associations, and the disposition words were related by virtue of inferences that subjects made on reading the sentences. Disposition cues retrieved the entire sentence 65 times as compared with 51 times for the verb associate, a significant superiority, as our a posteriori test revealed. In addition, the disposition words retrieved combinations that included the actor significantly more often than did the semantic-verb associates. These patterns of recall are more consistent with the encoding-specificity notion, which holds that the sentence is linked in the episodic memory system with the disposition word, which is a de facto input cue because it was inferred at encoding. Although the disposition cues may arguably have a semantic association with some of the sentence predicates (as the pretest for Experiment 2 showed clearly), the actors, which were randomly paired with predicates, certainly had no a priori associations with the disposition words (e.g., carpenter: considerate). Hence the superior recall of entire sentences, including the semantically unrelated actors, through disposition cuing suggests that those cues were operating on episodic memory of the sentences' representations more than on their semantic representations.

A second issue concerns the most likely locus of the inference in information processing, short-term or long-term store. Even if important a priori associations between disposition words and sentences were ruled out, the possibility would remain that a personality inference is made, not at encoding, but at a later processing stage, during retrieval perhaps (Postman, 1972). Even though this interesting possibility has not been absolutely eliminated in the present experiments, several circumstances make it less plausible than the encoding hypothesis. If inferences were made when the sentences were retrieved, one would expect noncued recall to be as strong as disposition-cued recall, or at any rate much higher than
it was, because the sentences must have been retrieved from long-term store before inferences could be made on them. Because non-cued recall is much lower than disposition-cued recall, a nonencoding hypothesis must hold that subjects made inferences from the sentences while they were available but not accessible (cf. Tulving & Pearlstone, 1966). In other words, sentences that had not been retrieved from long-term store would be the basis of personality inferences, in this scenario. This possibility seems much less parsimonious than the hypothesis that the inferences are made from the sentences while they are held in short-term store during encoding. Thus, the data suggest that such inferences may be an intrinsic part of the process of encoding information and do not always require a separate mental operation subsequent to information retrieval.

The fact that subjects made covert trait inferences without intentions to do so brings up the intriguing possibility that trait inferences may qualify as automatic processes. This issue has important implications for the question of how spontaneous such social inferences are, because automatic processes possess characteristics that would strongly argue for their spontaneity (e.g., being difficult to suppress or change). In addition to the absence-of-intentionality characteristic, however, automatic processes may occur without awareness and without interference from other ongoing mental activity (Bargh, 1984; Hasher & Zacks, 1979; Kahneman, 1973; Posner & Snyder, 1975; Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977). The present evidence for absence of awareness is problematic because the 10-min interval between encoding and reporting leaves open the possibility that subjects may have been momentarily aware of their mental processes but forgot them by the time they were asked to introspect. The criterion of absence-of-interference from simultaneous mental activity has not been addressed in the present experiments. This issue, as well as other criteria for automaticity, is being investigated in current research.

One limit to the generality of these findings must be pointed out. The sentences used in the experiments described actions that, in Jones and Davis' terminology, are correspondent to personality traits. Correspondence, in their theory, means the extent to which "the act and the underlying characteristic or attribute are similarly described by the inference" (Jones & Davis, 1965, p. 223). Our sentences were not only written to represent correspondent acts but were also selected from a set of 39, partly on the basis of pretest subjects' ability to make reliable and consensual correspondent inferences. Thus there were no sentences like, "The man walks down the street." We are not suggesting that people make personality inferences about every piece of behavior they observe. But it should also be remembered that sentences were pretested for vividness or extremeness. Thus it cannot be said that only extreme behaviors instigate trait inferences. Some commonplace behaviors do too.

What are the implications of the possibility that inferred dispositions are often stored in memory with behavioral information? There is a body of research that has explored the relation between the memory status of social information and consequent judgments (e.g., Carlston, 1980; Higgins & King, 1981; Taylor & Fiske, 1978; Reyes, Thompson, & Bower, 1980; Srull & Wyer, 1979). The import of this research is that the accessibility of information has an impact on the outcome of social judgments, such as decisions of guilt or innocence. Our results suggest that dispositional judgments may be made unintentionally at encoding and stored with the information on which they are based. That should increase their subsequent accessibility, and this may influence subsequent judgments. When the original unintended dispositional judgment is evaluative, it may prejudice subsequent judgments, perhaps without the judge's awareness.

A second implication is that the relative effectiveness of dispositional cues in recall of behavioral information may be one basis for the overestimation of behavioral consistency across situations or time. People frequently make this error in perceiving others (Mischel, 1968). There is recent evidence (Lenauer, Sameth, & Shaver, 1976; Moore, Sherrod, Liu, & Underwood, 1979) that people increasingly make this same error in self-perception as time passes.

A third implication is that if dispositions are stored in memory with supportive behavioral information, then memory searches using these dispositions as retrieval cues may be one
basis for the occurrence of confirmatory hypothesis testing (Snyder, 1981) and perseverance effects (Ross & Anderson, 1982).

Perhaps the most basic issue concerns the early assumptions expressed by seminal person-perception researchers regarding the facile nature of these processes. The possibility that trait inferences are encoding specific and spontaneous would tend to support these notions and to suggest that such processes occur when behavior is being casually observed, in ordinary situations entirely lacking the character of laboratory experiments. The supposition that they are not occurring when not instructed is therefore gratuitous, and researchers who present subjects with descriptions of behavior, for any experimental purpose, should be mindful of this possibility.

References


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