Unintended Effects of Goals on Unintended Inferences

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Three studies investigated unintended effects of goals on spontaneous trait inferences (STIs). Ss read trait-implying sentences to memorize them, to analyze sentence features, or to make social judgments. Cued recall revealed unintended (spontaneous) trait and behavioral-gist inferences. They were equally frequent with all the social judgment goals and absent or infrequent with feature analysis goals. Memorizing the sentences while ignoring their meaning reduced, but did not eliminate, STIs. Goals also affected whether traits were linked directly to actors in explicit memory. Social inferences can occur without intentions or awareness, even when meanings are intentionally ignored, as incidental results of analyzing stimulus details, and as intermediate but unnoticed results of other social judgments. Goals affect these inference likelihoods.

People often draw conclusions about other people's personality characteristics without considering how they are constrained by their situations or personal histories (e.g., the correspondence bias). Although people are good at accounting for their own behavior in terms of external pressures, they are quick to label others with personality traits (Jones & Nisbett, 1972). Humans' limited cognitive capacity, which prevents them from processing the full complexity of the social environment, and their desire to control their social worlds both lead them to categorize others, repeatedly and habitually. Eventually, people develop the capacity to do so spontaneously—outside of awareness and without conscious intent (see Newman, 1991; Newman & Uleman, 1989; Uleman, 1987, 1989).

Is this process of labeling others, with no awareness of it, so well learned that it occurs whenever a person attends to relevant information? Even when people's goals do not require them to judge others, do they do it anyway? It is well-known that intentional actions can have unintended consequences. Could intentional cognitive processes have unintended consequences too? One might have the goal of evaluating a colleague's professional competence and find oneself engaged in gender stereotyping and perhaps illegal discrimination (e.g., Bersoff & Verrilli, 1991). One might have the goal of avoiding particular thoughts only to end up thinking them even more (e.g., Wegner & Schneider, 1989). Thus, various unintended thoughts may result from our goal-directed cognitive processing.

Spontaneous trait inferences (STIs) are a particularly interesting class of unintended thought because they are unconscious as well as unintended. Even though the individual may not experience any overt effects of making such inferences, STIs can be unexamined and furtive influences on our subsequent conscious thoughts (Hamilton, 1988; Newman & Uleman, 1989, 1993) and unconsciously color or "prime" our impressions of others (Moskowitz & Roman, 1992). The current experiments examine the unintended effects of goals on the formation of STIs.

Goals' Relations to Unintended Thoughts

There is growing interest in the effects of information-processing goals on cognitive outcomes (see Fiske, 1993). Prominent examples include Chaiken, Liberman, and Eagly's (1989) accuracy, defense, and impression goals in social influence; Gollwitzer's (1990, 1993) deliberative versus impromptu mindsets; Hilton and Darley's (1991) assessment set versus action set in social interactions; and Kruglanski's (1989) epistemic motives. In the realm of dispositional inference in particular, goals have been shown to mitigate the occurrence of the overattribution effect (Tetlock, 1985; Webster, 1993), the correspondence bias (Krull, 1993), priming effects in social judgment (Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1993), primacy effects (Kruglanski & Freund, 1983), and salience effects (Borgida & Howard-Pitney, 1983). In each of these examples, however, the goals are exerting an influence on intended thoughts; subjects have the goal of forming an impression in addition to their other processing goals. Our interest is in goals' effects on unintended thoughts.

Conscious goals may be related to unintended thoughts in two ways. First, unintended thoughts may occur as intermediate results in the pursuit of a conscious goal, but without the person realizing it. The results of prior memory goal studies (Bassili & Smith, 1986; Winter & Uleman, 1984) may illustrate this. In these studies, subjects read trait-implicating sentences to prepare
for a memory test. If subjects used elaborative encoding as a mnemonic strategy, the elaborations could have included trait inferences without their realizing it. Consistent with this, when these sentences were read as distractors (Uleman, Newman, & Winter, 1992; Winter, Uleman, & Cunniff, 1985), so that subjects did not have the goal of trying to memorize them, recall was much poorer on a surprise memory test. Whereas this suggests that elaborations are a way to pursue the goal of memorizing the sentences, it also suggests that trait inference may be the unintended byproduct of the particular cognitive processes used in that goal pursuit. The goal of memorizing meaningful verbal material can be achieved through several processing strategies including visualizing it, associating it with preexisting visual frameworks (the method of loci), and elaborating on it verbally (Anderson & Reder, 1979). Each strategy may have different unintended consequences on spontaneous trait inference, but no studies have examined spontaneous trait inference as a function of such strategic differences. Experiment 1 below does this by comparing STIs generated by subjects with a simple memory goal, with STIs generated by subjects with the goal of trying to memorize the sentences while ignoring their meaning.

Second, unintended thoughts (such as STIs) may occur more generally whenever a goal requires attending to the relevant stimuli (trait-implying sentences), regardless of whether the thoughts are relevant or instrumental to the desired outcome. As noted, simply attending to these sentences as distractors produces STIs. Simple attention may activate trait concepts, just as attending to color names in the Stroop task activates color concepts. Experiment 2 examines this possibility. Subjects had the goal of analyzing either the smallest sentence features, letters (graphemes); or larger units, the sounds of syllables (phonemes); or entire words’ meanings (semantic features). These goals require attending to the sentences, but not to their overall meanings. The goals were suggested by the effects of depth of processing on encoding and memory (cf. Cermak & Craik, 1979).

Although the effects of memorization strategies or attending to sentence features may illustrate ways that STIs can be unintended consequences of processing goals, these goals bear little resemblance to those that people frequently adopt in the course of their social lives. In Experiment 3, we examined the effect of social judgment goals on STIs. Social judgment goals require attention to overall meanings, but need not involve traits. Trait inferences may occur if the goal explicitly requires it, or they may occur as an intermediate or incidental result of goal pursuit, without the person realizing it. Experiment 3 examines these possibilities by asking subjects to make the types of judgments we typically make in social situations. Some subjects formed self-relevant nontrait judgments, and others were explicitly asked to make (intentional) trait judgments.

As a secondary issue, we also planned to analyze these data for evidence of direct links between trait cues and actors, to more fully explicate what the trait inferences formed by our subjects actually represent. Several theorists (Gilbert, 1989; Jones & Davis, 1965; Trope, 1986) have noted that the same trait term can be used to describe (a) a behavior or (b) the actor who performs the behavior. In addition, developmental (e.g., Rotenberg, 1982) and social (Trope, 1989) psychologists have distinguished between trait terms that describe an actor’s current state and those that describe (c) dispositions that are stable across time and situations. (See Bassili, 1989b, and Newman & Uleman, 1989, 1993, for more complete discussions.) STIs were discussed initially (Winter & Uleman, 1984) without these distinctions in mind and implicitly as descriptions of actors rather than mere behaviors.

Overview of Designs and Analyses

Evidence for STIs comes primarily from cued-recall studies (e.g., Uleman, Winborne, Winter, & Schechter, 1986; Winter & Uleman, 1984). In these, subjects typically read a series of sentences for a subsequent “memory test.” Each sentence describes an actor (usually designated by an occupational role) performing a behavior that implies a trait (e.g., “The businessman steps on his girlfriend’s feet during the foxtrot”). Subjects study the sentences with whatever memorization strategies they prefer. After a 2-min distractor task, recall is tested under both cued and noncued conditions (within subjects). Recall cued by the behavior-implied trait (e.g., clumsy) is of central interest. It is compared both with noncued recall and semantic-cued recall. Semantic cues provide an important control because their effectiveness does not depend on inferences made at encoding; they are a priori semantic associates to important words in the sentences.

The logic of the cuing conditions in this paradigm is based on Tulving’s (1983) principle of encoding specificity. It states that specific retrieval cues facilitate recall if and only if the information about them and about their relation to the to-be-remembered words is stored “at the same time” as the information about the membership of the to-be-remembered words in a given list. (p. 223)

Most research on encoding specificity explicitly presents subjects with incidental information at encoding and shows that it aids recall. Its effectiveness is compared with strong semantic associates to the to-be- recalled information, which controls for the possibility that the incidental information has undetected preexisting associations to the target information. Our paradigm, using the principle of encoding specificity, depends on subjects’ implicitly presenting this incidental information to themselves at encoding (i.e., making trait inferences). Thus, inferences made at encoding are detected by comparing the cuing effectiveness of inferred concepts (such as traits) with strong semantic cues and with no cues. Strong semantic cues provide estimates of the maximum effectiveness of preexperimental, a priori retrieval routes to the stimuli. If inference-based cues are at least as effective as strong semantic associates, without being strong associates themselves, then their effectiveness must be based on inferences and associations formed at encoding rather than mere semantic knowledge from long-term store. In most past research (see Uleman, 1987, for a review), trait cues have met both criteria: They were more effective than no cue, and they were at least as effective as strong semantic cues for sentence recall.

Other inferences may be made at encoding. Winter et al. (1985) also used “gist cues,” which summarize the action in the sentences but in a trait-irrelevant manner. For example, “The child tells his mother that he ate the chocolates” can be summa-
rized as confessing. This behavioral gist is as effective a retrieval cue as the trait honest. Such gist cues are not directly relevant to trait attributions. In Trope's (1986) model, dispositional inferences depend on identifying the current behavior, the current situation, and the actor's prior identity. Behavior identifications logically precede dispositional inferences. In Gilbert's (1989) model, behavior is categorized before the person is characterized. However, both of these models assume "that identification processes represent the incoming stimulus information in terms of attribution-relevant categories (e.g., friendly or unfriendly behavior, and friendly or unfriendly situation). The results of these processes serve as input for dispositional inference" (Trope, 1986, p. 239, emphasis added). However, our behavioral gist inferences need not precede trait inferences, because they are not trait-attribute-relevant behavior categories.

In each experiment below, subjects read the same set of trait-implying sentences (selected on the basis of pretests; see Winter & Uleman, 1984) with various goals in mind. Then after a brief distractor task to clear short-term memory, they recalled as many sentences as possible under four different, within-subject cueing conditions: trait, gist, semantic, and no cue. Cue type was counterbalanced over sentences and across subjects in a Latin-square design, and the same cues were used in all experiments.

In addition to including various goals, these studies differed from Winter and Uleman's (1984) in two ways. First, as in Winter et al. (1985), subjects' awareness of their own encoding strategies was assessed immediately after they read the last sentence, before the distractor and cued recall. This makes these reports less dependent on subjects' generalizations over all the sentences in the task and less dependent on their memory of earlier awareness (as recommended by Ericsson & Simon, 1980). Second, each study included a task to provide evidence that subjects actually pursued our intended cognitive goal.

**Experiment 1**

This study was designed to determine whether instructions to ignore sentence meanings might reduce spontaneous trait inferences, by reducing elaborative encoding that includes traits. If STIs occur as an unintended byproduct of carrying out the goal of memorizing sentences through verbal elaborations, then having subjects avoid elaborations should reduce spontaneous trait inferences.

**Method**

**Subjects and design.** Volunteers (N = 72) from introductory psychology classes participated for partial course credit. Half got simple memory instructions, and half got rote memory instructions. Four cue types, rotated through blocks of sentences in a Latin square design between subjects, aided sentence recall: traits, behavioral gists, semantic cues, and no cue. Recall of sentence actors and predicates was treated separately, because the three predicate parts—verb, object, and phrase—were recalled together more often than the actor was with any of them. This produced a 2 x 4 x 2 (Goal x Cue Type x Sentence Part) design, with the last two factors within subjects. Two other factors, order and pairing, were included to counterbalance stimuli; they are described below. Preliminary analyses indicated that they made little difference, so they were dropped from further analyses.

**Goal instructions and other materials.** Consent forms described the general procedure. Instruction sheets described the specific task for each condition, included examples of responses, and contained response lines for 18 sentences.

Subjects with the simple memory goal were instructed to study each sentence carefully, for a memory test which will occur later. Memorize each sentence as fully as possible by repeating it silently to yourself. For each time you repeat a sentence place a check mark (✓) after that sentence's number on the paper below. For example, if you were able to repeat the sentence: "The policeman ticketed speeders whenever their speed exceeded 60 miles per hour" three times before the next sentence appeared, your paper would look like this:

✓

Subjects with therote memory goal were instructed to study each sentence carefully ... by repeating it silently to yourself. Do not spend time trying to think about the sentences' meanings—what kinds of people they describe, what the events might look like, and so on. The meanings of these sentences are not important. Just repeat the words in the sentence clearly and carefully to yourself in the order they appear. For each time you repeat the sentence place a check mark (✓) after that sentence's number on the paper below. For example, ...

The same example sentence was used in all conditions of all three experiments.

The focal sentences consisted of buffers in the first and last positions and 16 others drawn chiefly from Winter et al. (1985). Each of the 16 was associated with three cue types: traits of the actor, trait-irrelevant gists of the behavior, and semantic associates to the actor. Cued-recall sheets contained cues for 12 of the 16 sentences and 6 additional blank lines for noncued recall of the 4 other sentences and the 2 buffers. Four different sheets were created by pairing 4 blocks of 4 sentences each with the 4 cue types in 4 different ways, in a Latin square design. Each subject received one of these, producing a 4-level between-subjects pairing factor.

An Awareness Questionnaire asked subjects for an open-ended description of "what went through your mind as you read that last sentence. What did you think of..." Responses were scored for the presence (1) or absence (0) of thoughts about the actor's traits or personality. The questionnaire also called for four ratings, on 11-point scales, of how much they experienced visual imagery to the sentences, verbal associations to sentence words, judgments about causality or responsibility for sentence behaviors, and judgments about the personalities or personal qualities of sentence actors.

**Procedure and analyses.** Subjects were run in small groups with the same instructions. A Kodak carousel slide projector displayed sentences on the wall for 6 s each, with 2 s between sentences. With buffer sen-

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1 Rather than Winter et al.'s (1985) Sentences 7 and 9, which are particularly vivid and memorable, we used "The deliveryman slows down and motions the pedestrians to cross" with cues milk, driving, and considerate and "The architect carries the Scouts out of the burning forest" with cues buildings, rescue, and brave. This required substituting carpenter and the semantic cue wood for deliveryman in their Sentence 6. We also substituted pharmacist and the semantic cue drugs for tailor and cloth in their Sentence 16, to eliminate the unintended cueing of tailor by the three-piece suit cue from their Sentence 3. Finally, their Sentence 12 was changed to "slips an extra $50."


| Table 1: Percentage Recall by Cue Type and Sentence Part: Experiments 1–3 |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
|                             | Experiment 1              | Experiment 2               | Experiment 3               |                             |
|                             | MEM (n = 36) | ROTE (n = 36) | GRAPH (n = 35) | PHON (n = 34) | SEM (n = 32) | BEHAV (n = 40) | PERS (n = 41) | IMPR (n = 36) |
| Actor recall                |                     |                             |                             |                             |               |               |               |               |
| Gist                        | 21.53a               | 10.42a                      | 5.71a                      | 3.68a                      | 3.13a         | 40.00a        | 17.68ab       | 31.94a         |
| Trait                       | 11.81b               | 8.33a                       | 0.71b                      | 1.47b                      | 3.91b         | 25.00b        | 15.24ab       | 28.47a         |
| Semantic                    | 22.22a               | 21.53a                      | 5.71a                      | 1.47b                      | 32.81a        | 28.75ab       | 25.61a        | 20.14ab        |
| None                        | 15.97ab              | 5.56a                       | 2.86ab                     | 0.74a                      | 7.81a         | 12.50c        | 9.15c         | 12.50b         |
| Predicate (verb + object + phrase) recall |                     |                             |                             |                             |               |               |               |               |
| Gist                        | 28.24a               | 17.82a                      | 9.29a                      | 5.39a                      | 3.39b         | 48.75a        | 44.31a        | 49.77a         |
| Trait                       | 21.30b               | 12.27ab                     | 2.62b                      | 3.68ab                     | 7.29b         | 32.08b        | 33.54a        | 40.97a         |
| Semantic                    | 11.34c               | 9.72bc                      | 3.33b                      | 0.98bc                     | 3.65ab        | 20.63b        | 15.24a        | 17.82b         |
| None                        | 15.05c               | 6.71e                       | 2.14b                      | 0.25b                      | 1.56b         | 13.54e        | 17.07c        | 21.06b         |

Note. Within columns and goal conditions means for each sentence part that share a subscript are not significantly different at p < .05, two-tailed t tests on square root transformations of proportions recalled. Goal abbreviations are MEM = memory; ROTE = memory through rote repetition; GRAPH = grapheme analysis; PHON = phoneme analysis; SEM = semantic analysis of genders; BEHAV = judge behavioral similarity; PERS = judge personal similarity; IMPR = impression formation and report traits.

Results

Cued-recall scores (transformed) were analyzed in a 2 × 4 × 4, Goal × Cue Type × Sentence Part ANOVA. This revealed a main effect for goal, F(1, 70) = 5.48, p < .022, in addition to expected effects for cue type and Cue Type × Sentence Part, ps < .0005. There were no significant interactions with goal, ps > .25. Untransformed means are shown in Table 1, columns 1 and 2. Recall was lower with rote memory instructions, confirming the hypothesis.

Even though the goal did not interact with cue type, we performed planned comparisons to explore goals’ effects on the kinds of encoding elaborations represented by each cue type. Elaborations at encoding should not affect cue recall that depends primarily on a priori, preexperimental associations in semantic memory, that is, semantic-cued recall. The means in Table 1 confirm this, t(70) < .55, ps > .60. By contrast, gist-cued and noncued recall (which depend on gist and idiosyncratic elaborations, respectively) were both lower in the rote memory condition, t(70) > 2.00, one-tailed ps < .025. Trait-cued recall tended to be lower in the rote memory condition, but only for predicates, t(70) = 1.63, one-tailed p < .055, not actors, t(70) = 1.01, p > .15.

Finally, we compared cued recall of each sentence part within goal conditions to determine whether STIs occurred in each by the usual criteria. The t test results are in Table 1. With the rote memory goal, both trait and gist cues produced higher recall of the predicate than semantic cues or no cues. This is clear evidence of both STIs and gist inferences at encoding, even though recall was generally lower with this goal.

With the simple memory goal, predicate recall was higher for gist cues (28%) than trait cues (21%), which produced higher recall than semantic cues (11%), ps < .02. This latter difference suggests that STIs occurred. However, noncued predicate recall was so high (15%) that trait-cued predicate recall (21%) was not significantly higher (two-tailed p < .11). Thus, the evidence is clear for spontaneous gist inferences, by both the semantic-cued standard ("at least as high as") and the noncued recall standard ("higher than"). But the evidence for spontaneous trait inferences is less clear. This, and trait-cued recall being lower than gist-cued recall, suggests that reporting on sentence repetitions may have interfered with trait elaborations at encoding.

Process reports. Subjects reported the number of times they repeated each sentence. Shorter sentences were repeated more often in each condition, rs(15) > .85, ps < .001, and repetitions were more frequent when subjects avoided thoughts about the sentences’ meanings, 3.12 per sentence versus 3.01, t(15) = 2.2, p < .05.

2 Log_{10} and log_{2} transformations were not as effective in reducing skew; arcane transformations increased it.
Awareness. Very few subjects mentioned person thoughts on the open-ended question (simple = 14% androte = 6%), and this did not differ between goals. We correlated all five awareness measures with the transformed recall scores for actors and predicates, for each of the four cue types in each condition (Ns = 36) to determine whether there was any veridical awareness of spontaneous inferences. Under rote memory instructions, none of these 40 correlations reached the .05 level, indicating no awareness of making trait inferences. However, under simple memory instructions, 7 (18%) of these correlations were significant. Rated frequencies of trait thoughts correlated with trait-cued recall of actors (r = .43, p < .01) and of predicates (r = .37, p < .03). Person thoughts on the open-ended question correlated with trait-cued recall of actors (r = .49, p < .01). Rated frequencies of trait thought also correlated with gist-cued recall (rs > .45, ps < .01). This suggests considerable awareness of trait inferences at encoding, contrary to previous findings with a simple memory goal.

Discussion

When subjects memorized trait-implicating sentences by simple rote repetition, without thinking about their meanings, spontaneous trait inferences still occurred. This demonstrates that consciously controllable elaborative encodings are not required for STIs. And as in most past research, they occurred without awareness. However, avoiding elaborative encodings had unique effects. It generally reduced recall and specifically reduced trait- and gist-cued recall. And because these were repetitions without elaboration, there were more of them in the time allowed for each sentence. (Clearly mere repetition does not improve recall; Craik & Watkins, 1973.)

These results suggest that prior evidence of spontaneous trait inferences under general memory instructions was partly due to controllable, but uncontrolled encoding elaborations, entailed by subjects’ usual mnemonic strategies. Consistent with this, Winter and Uleman’s (1984) trait-cued total recall (40.3%) was much higher than recall in our rote memory condition (11.3%). Nevertheless, it is important to note that STIs still occurred with a rote repetition memory goal. Trait-cued predicate recall was higher than noncued predicate recall and at least as high as semantic-cued predicate recall. Spontaneous trait inferences occur when subjects have a memory goal, even when they try to avoid elaborative meanings at encoding.

The results from the simple memory condition were not quite as predicted. First, recall was much lower than in previous memory studies such as Winter and Uleman’s (1984). Compare their trait-, semantic-, and noncued predicate recall of 42.3%, 30.8%, and 23.2%, respectively, with ours of 21.3%, 11.3%, and 15.1% (Table 1). Second, the evidence for spontaneous trait inferences was only marginally significant. And third, there was evidence of accurate awareness of trait inferences at encoding. The major difference between this condition and previous STI memory studies was in asking subjects to report their sentence repetitions by checking each one. In addition, the awareness questionnaire came immediately after the last sentence presentation and was therefore more sensitive than the delayed measures used by Winter and Uleman. It seems likely that the additional task of reporting each repetition both encouraged more repetitions, thereby reducing elaborations (see above), and focused subjects’ attention on their thoughts during sentence processing, including trait thoughts. Future research should test these possibilities.

Experiment 2

When people try to memorize trait-implicating sentences without thinking about their meanings, they still make trait inferences. Does this mean that simply attending to these sentences produces trait inferences? Are the trait concepts implied by these sentences similar to the color concepts activated by words in the Stroop task? This experiment was designed to determine whether goals of analyzing discrete sentence features could reduce or eliminate STIs. We varied the size of the sentence features that subjects analyzed. The smallest features were graphemes, Hs in particular. The intermediate-sized features were sounds, that is, phonemes. The largest features were semantic units, specifically the genders of nouns and pronouns. We predicted that spontaneous trait inferences would be more frequent when the subjects’ goal was to analyze the larger features that contribute to sentence meanings.

Method

Subjects, design, and procedure. Volunteers (N = 101) from introductory psychology participated for partial course credit. The design and procedures were the same as in Experiment 1 except for subjects’ goals and related tasks. Three rather than two goals produced a 3 × 4 × 2 (Goal × Cue Type × Sentence Part) design, with the last two factors within subjects. Subjects’ goals were to analyze either graphemes, phonemes, or semantic features (gender) of words in the sentences. Two other factors were included to counterbalance stimuli, order, and pairing. As in Experiment 1, they made little difference, so they were dropped from further consideration.

Goal instructions. Subjects with the graphemic analysis goal learned that the study concerned people’s ability to “quickly and accurately locate particular letters in meaningful sentences.” For each sentence, they were to locate Hs in the sentence that do not follow the letter T, and write them down along with the letter that comes right before the H, if there is any. If the H follows the letter T then ignore it and do not write it down. Notice that the simplest way to do this is to treat each letter as an isolated unit and not as a part of a word. Simply scan the line for Hs. For example, . . .

Hs were selected for this task because they appeared in a wide variety of different phonemes (e.g., he, child, neighbor, pharmacist, and publish).

Subjects with the phoneme analysis goal learned that the study concerned people’s ability to quickly and accurately locate particular sounds in meaningful sentences . . . decide whether any of the words, or word parts in the sentence, sound the same as, or rhyme with the target words for that sentence, which are listed below. Notice that the simplest and

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3 There were also uninterpretable correlations between semantic-cued recall of actors and rated frequencies of visual images (r = .35, p < .05) and semantic associations (r = .40, p < .01).
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quickest way to do this is to pay attention to the sounds of the individual words, not the words themselves or their organization into a sentence. . . . For example, in the sentence: [same example sentence], the target words might be listed as:

bear need do

"bear" rhymes with "their," "need" rhymes with "speed," and "do" does not rhyme with anything in the sentence. Notice that the targets don’t have to have the same spelling as sentence words in order to rhyme with them, as with "bear" and "their."

Subjects with the semantic analysis goal learned that the study concerned people’s ability to
quickly and accurately extract information about people’s gender: whether they are biologically male or female, . . . decide, for every noun or pronoun (his, they, her), what the gender of the person or group it refers to is—Male (M), Female (F), or Unknown (U). For example, in the sentence: [same example] "policeman" is male (M), "speeders" is unknown (U), and "their" is also unknown (U).

For each sentence to be shown, there is a series of (M–F–U), one for each person or group designated by a noun or pronoun in the sentence . . . your task is to circle M, F, or U for each noun or pronoun in the sentence, and then put the first letter of the noun or pronoun in the blank space after the (M–F–U). Do not guess at M and F; circle U if gender is not clearly stated. Don’t forget to list the first letter of each of the words you classify by gender . . .

Results

Cued recall. Cued-recall scores (transformed) were analyzed in a 3 × 4 × 2, Goal × Cue Type × Sentence Part ANOVA. There were expected effects for cue type, sentence part, and their interaction, ps < .01; and a main effect for goal, F(2, 98) = 4.32, p < .016. Recall was greatest for the semantic goal (59.56%), followed by the graphemic (43.20%) and phonemic (23.98%) goals. Goal also interacted with cue type, F(6, 294) = 4.07, p < .001; with sentence part, F(2, 98) = 3.95, p < .025; and with both factors, F(6, 294) = 3.30, p < .005. The reasons for some of these are evident in Table 1, data columns 3–5. Testing our hypotheses requires more focused analyses.

We hypothesized that analyzing sentence features would reduce spontaneous trait inferences, relative to a memory goal. This was tested by comparing recall in this experiment, pooled over goals, with the simple memory condition of Experiment 1 (data column 1 in Table 1). This is a conservative test because recall was low in that goal condition, relative to previous memory studies. All of these comparisons were highly significant, t(df > 37 for separate variance estimates) > 2.8, ps < .01. Both cued and noncued recall were clearly lower in Experiment 2, supporting the hypothesis and indicating that trait, gist, and other elaborations were less frequent at encoding with feature analysis goals. Even semantic-cued recall of the actor was lower (13.3 vs. 22.2), although this was the smallest difference because it is more heavily based on preexperimental semantic associations.

We also hypothesized that analysis of larger (semantic) sentence features would produce more STIs than analysis of smaller (graphemic) features. A 3 × 2, Goal × Sentence Part ANOVA on trait-cued recall revealed a significant linear trend as the only effect for goal, F(1, 98) = 5.10, p < .03. Transformed means were .086, .121, and .249 for graphemic, phonemic, and semantic analysis, respectively, as predicted. A parallel ANOVA of gist-cued recall revealed a very different pattern: a significant linear trend that also interacted with sentence part, F(1, 98) > 4.75, ps < .031. There were no differences in recall of actors, but predicate recall was lower when larger sentence features were analyzed: .515, .315, and .164 for graphemic, phonemic, and semantic analysis, respectively, F(1, 98) = 5.82, p < .02.4 Spontaneous trait and gist inferences are clearly different.

Finally, we analyzed recall to see whether STIs and/or gist inferences occurred reliably within each goal condition, by the usual criteria of exceeding noncued and at least matching semantic-cued recall. When the goal was graphemic analysis, protected t tests showed that predicate recall was significantly higher for gist cues than all other cues, which were equivalent (p > .45). There were no relevant differences among cues for actor recall (see Table 1, data column 3). Thus, analyzing graphemic features prevented STIs but permitted gist inferences.

When the goal was phonemic analysis, both STIs and gist inferences occurred. Table 1 (data column 4) shows significant different inferences in predicate recall for both cue types. Thus, searching for rhyming syllables produced both spontaneous trait and gist inferences. When the goal was analyzing semantic features, only trait inferences occurred. Trait-cued predicate recall was significantly higher than noncued recall, and higher than semantic cued recall (see Table 1, data column 5). Gist-cued predicate recall did not differ from either. Thus, analyzing noun and pronoun genders permitted STIs but prevented gist inferences.

Process reports. None of the subjects’ reports of processing correlated significantly with recall of any kind.

Awareness. Awareness of trait inferences was not evident under any of the goal conditions. Of the 120 correlations computed among the five awareness scales, three goal conditions, four cue types, and two sentence parts, only 8 (6.7%) reached the .05 significance level. Only three of these involved trait-cued recall, and they involved actor rather than predicate recall. So no correlations were consistent with accurate awareness of trait inferences at encoding.

Discussion

These three goals of analyzing trait-implying sentence features clearly reduced STIs (relative to a simple memory goal), as predicted. But they did not eliminate them. As predicted, they were more frequent when the goal entailed analyzing larger sentence features. The graphemic goal produced no evidence of STIs, and the semantic goal produced the most STIs.

These results also demonstrated the importance of distinguishing between trait-relevant categorizations of behavior and other possible categorizations. Although STIs increased with larger sentence features, trait-irrelevant gist inferences de-

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4 Semantic-cued and noncued recall both showed linear and quadratic trends, but only for recall of actors. For semantic-cued recall, this was due to high recall for the semantic goal, F(1, 98) > 24.0, p < .0005. The pattern was the same but weaker for noncued recall, F(1, 98) > 4.50, p < .05; see Table 1.
creased. There was a significant linear trend for each cue type, and they went in opposite directions. This suggests that these two kinds of behavior categorizations may be mutually exclusive. To examine this, we correlated gist-cued and trait-cued total recall within goal conditions, partialling out noncued recall to control for individual differences in general memory ability. For the phonemic goal, in which both inferences occurred to a significant degree, the correlation was positive (.25) but not significant. But it was significant and positive for graphicemic and semantic goals (.38 and .55, respectively), suggesting that trait and gist categorization can co-occur spontaneously. There is certainly no evidence that they are mutually exclusive.

It is possible that our particular semantic goal of identifying nouns' and pronouns' genders produced more trait inferences than other semantic goals would. Genders are properties of persons. So this particular semantic goal may have increased the accessibility of other person-relevant concepts such as traits (e.g., Higgins, 1989) or activated person-judging procedures that are not content specific (e.g., Smith, Branscombe, & Bormann, 1988). Future research should examine this possibility.

Experiment 3

People seem to infer the characteristics of others quite effortlessly. The use of traits to describe others first becomes evident in middle childhood (Livesley & Bromley, 1973) and remains quite common for adults (Fiske & Cox, 1979; Park, 1986), at least in Anglo-American culture (Miller, 1984; Newman, 1991). So it is possible that trait inferences also occur as intermediate steps or outcomes in the process of making other social judgments. This study was designed to examine this possibility. Subjects judged their own similarity to the actors in the sentences and then their memory for the sentences was unexpectedly tested. We included a comparison condition in which subjects made explicit trait inferences about sentence actors. The hypothesis was that nontrait social judgments would make STIs more frequent than memory goals, but less frequent than when they were explicitly required, as indexed by cued recall.

Two nontrait social judgments were used. Some subjects judged whether they would engage in the behavior described in the sentence. On the basis of the actor–observer effect (Jones & Nisbett, 1972), we expected subjects to consider primarily situational rather than dispositional causes for these behaviors and to make relatively few STIs. Other subjects judged how similar they were to the sentence actors, as persons. We expected this to produce more STIs because, although not explicitly calling for trait inferences, this judgment implicitly refers to stable personal characteristics. A third group of subjects made explicit trait judgments.

We were also interested in analyzing these data for evidence of direct links between trait cues and actors. As noted above, the same trait term can be used to describe a behavior or the actor who performs the behavior. Bassili's (1989b) "traits-as-attributes" might be distinguished from "traits-as-action-categories" by examining the links between trait cues and sentence parts in memory. If STIs are merely inferences about the behaviors, traits should cue recall of behaviors but have no additional power to retrieve actors. However, if they are inferences about actors as well, they should cue actors too.

Method

Volunteers (N = 117) from introductory psychology classes participated for partial course credit. The design and procedures were the same as in Experiment 2 except for the goals and related tasks.

Subjects with the goal of judging behavioral similarity learned that the study concerned people's ability to judge how likely it is they would perform particular behaviors, if they were in a situation where that was possible . . . decide how likely you would be to do what the sentence describes, if you were in that situation. . . . Of course there are no right or wrong answers on this task. The characters in these sentences are fictional; you are given very little information about them and their actions; and no one can really know what they are like and why they behaved as they did. Nevertheless. . . . please do that for each sentence shown, on the [11-point] scales provided.

Participants with the goal of judging personal similarity learned that the study concerned people's ability to judge how similar they are to another person, even though that person is in a different situation from their own . . . decide how similar you are as a person to the subject of the sentence, while taking into account the fact that they may be in a completely different situation from your own, or may be doing something which you have never done yourself. . . . most people can and do make such estimates of how much other people who are in different circumstances from themselves resemble themselves.

Subjects with the goal of judging traits learned that the study concerned people's ability to, finally,

form impressions of other people's personality traits from simple single behaviors . . . form an impression of the subject, that is, the main actor in each sentence. After you have a clear impression, you are to write down one to three words which describe that impression, to the right of the sentence number below.

Results

Cued recall revealed no overall differences among goal conditions. A 3 × 4 × 2, Goal × Cue Type × Sentence Part ANOVA showed the expected effects for cue type, sentence part, and their interaction, Fs > 43.88, ps < .0005. However, goal produced no main effect, F(2, 114) = 1.47, p > .23, or interactions, Fs < 1.71, ps > .18. Our hypothesis predicts a linear trend with trait-cued recall of the predicate lowest for behavioral similarity judgments and highest for trait judgments. There was no evidence of that for either predicate or actor recall, Fs(1, 114) < 2.25, ps > .13. Parallel analyses of gist-cued recall also produced no evidence of linear trends, Fs(1, 114) < 2.50, ps > .11. All of these results clearly indicate that STIs, and gist inferences, were as frequent for the two social judgment goals as when trait inferences were explicitly required.

When subjects judged behavioral similarity, spontaneous trait and gist inferences occurred, both in terms of predicate

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5 The only other significant trends were quadratic trends for trait and gist-cued recall of actors, Fs(1, 114) > 8.30, ps < .01. Actor recall was lowest for judging personal similarity.
and actor recall (see Table 1, data column 6). Trait- and gist-cued total recall were not correlated reliably ($r = .24$), with non-cued recall partialed out as above. When subjects judged personal similarity, spontaneous trait and gist inferences occurred in terms of predicate recall, but actor recall indicated only spontaneous gist inferences (see Table 1, data column 7). Trait- and gist-cued total recall were correlated ($r = .31$, $p < .05$). Finally, the goal of making intentional trait inferences (Table 1, data column 8) produced spontaneous gist inferences, in terms of both predicate recall and actor recall. Trait- and gist-cued total recall were uncorrelated ($r = .10$).

**Process reports.** None of the subjects’ similarity ratings correlated significantly with recall of any kind. Yet the ratings were quite consistent. Mean sentence behavioral similarity correlated with mean personal similarity ($r = .78$, $p < .0005$), and these mean ratings did not differ between conditions, $t(15) < 1.0$.

**Awareness.** Subjects who judged similarity were not aware of making trait inferences. Only 6 (8%) of the 80 correlations between awareness measures and cued recall of actors and predicates for the two social judgment goals reached the .05 significance level. Subjects judging behavioral similarity who had some awareness on the open-ended question also had higher trait-cued predicate recall ($r = .36$, $p < .025$).

**Direct trait links to actors.** As would be expected, when subjects formed impressions of the actors in trait terms, traits (as well as gists) had direct links to actors in memory. Judging behavioral similarity produced marginal evidence for such links, and judging personal similarity produced no such evidence at all. We analyzed trait-cued recall of actors among only those sentences for which there was some recall of the predicate, thus effectively holding predicate recall constant. A within-subjects ANOVA among impression formation subjects showed significant effects for cue type, $F(3, 105) = 3.09$, $p < .03$. Trait cues produced higher actor recall than no cues, $t(35) = 2.36$, $p < .024$, as expected; gist cues did too, $t(35) = 2.88$, $p < .007$.

Among subjects judging behavioral similarity, the within-subjects ANOVA showed significant effects for cue type, $F(3, 117) = 3.44$, $p < .019$. Trait cues tended to produce higher actor recall than no cues, two-tailed $t(39) = 1.79$, $p < .082$. (Gist cues did produce more actor recall, $t(39) = 2.85$, $p < .007$.) Finally, among subjects judging personal similarity, the within-subjects ANOVA showed no effects for cue type, $F(3, 120) = 2.00$, $p < .12$. Gist (but not trait) cues produced higher actor recall than no cues, $t(40) = 2.09$, $p < .043$.

**Discussion**

These results suggest that spontaneous trait inferences occur as intermediate steps in making nontrait social judgments, without subjects’ awareness. This supports our major hypothesis. More interesting, these social judgment goals produced as much evidence of trait inferences as did intentional trait inferences. Trait cues were equally effective in all three goal conditions. Previous research has shown that intentionally making trait inferences increases the effectiveness of trait cues, relative to memory goals (Bassili & Smith, 1986). Our results show that other social judgments, apparently not involving trait inferences, can be just as effective at generating spontaneous traits at encoding. This is remarkable, particularly because subjects were unaware of these unintended trait inferences.

On the other hand, these goals did have different effects on producing direct links in explicit memory between traits and actors. Such links were clear for intentional impression formation, marginal for judgments of behavioral similarity, and absent for judgments of personal similarity.

We expected judgments of personal similarity to produce more STIs than judgments of behavioral similarity and perhaps clearer evidence of direct trait-to-actor links in memory. They did neither. Cued recall of actors was lowest for personal similarity judgments. Reexamining the instructions suggests why. These subjects seemed to regard actors’ identities (usually occupational roles) as irrelevant, because they were asked to take “into account the fact that they may be in a completely different situation from your own.” The actors’ “situations” apparently included their occupations. On the other hand, subjects judging behavioral similarity were asked “how likely you would be to do what the sentence describes, if you were in that situation” (emphasis added). Apparently, “that situation” included actors’ occupational roles, so they were sufficiently integrated with the STIs at encoding to produce higher recall.

**General Discussion**

People’s processing goals affect the inferences they make, even when the inferences are unintended and unconscious. In these studies, the goals people had when reading about behavior profoundly affected the inferences they made, as indicated by recall cues’ effectiveness (see Figure 1). These effects usually occurred without the subjects’ awareness. And the goals affected explicit memory links between inferences and stimuli (actors).

When the goal was to memorize trait-implying sentences through rote repetition (in Experiment 1), our subjects made trait inferences, but without being aware they had. When their goal was analyzing the smallest (graphemic) features of the behavior descriptions (in Experiment 2), they made no trait inferences. The goal of analyzing larger (phonemic and semantic) features produced more trait inferences, but not as many as a simple memory goal.

When the subjects made nontrait social judgments (in Experiment 3), they made spontaneous trait inferences as frequently as subjects making explicit trait inferences. However, social judgment goals differed in producing trait-to-actor links in explicit memory. When subjects judged the actor’s personal similarity to themselves, there was no explicit link from traits to actors. When they judged the likelihood that they would perform the behavior, these same trait inferences tended to link explicitly to actors. And (of course) when they formed impressions of the actors in trait terms, these traits were explicitly linked to the actors.

Experiment 1 also suggested that strategically controllable, but uncontrolled, elaborations at encoding were an important source of STIs in prior memory-goal studies. Subjects can intentionally prevent some elaborations; this reduces, but does not eliminate, STIs.
Unintended Cognitive Consequences of Conscious Goals

These results suggest three generalizations about goals and social inferences. First, conscious information-processing goals can have cognitive effects that are both unintended and unnoticed, that is, spontaneous. Even when they do produce their intended consequences (as they did in all the studies above), goals may produce unintended cognitive consequences as well. For example, trait inferences decreased relative to memory goals when subjects focused attention on feature analysis in Experiment 2. People may learn to manipulate their spontaneous inferences, without ever being able to identify them, by consciously adopting goals that direct their attention to such feature analyses. Such a strategy may have contributed to subjects’ ability to avoid inferences about their victims’ suffering and to be more obedient in Milgram’s (1974) classic studies of obedience. Indeed, one subject reported “It’s funny how you really begin to forget that there’s a guy out there, even though you can hear him. For a long time, I just concentrated on pressing the switches and reading the words” (Milgram, 1974, p. 38). Much of Langer’s (1989) work on “mindlessness” and Gollwitzer’s (1990) studies of mindsets may illustrate such unintended, but desired, effects of intentional information-processing goals.

Second, people may become aware of initially unintended cognitive processes and outcomes (e.g., the simple memory condition in Experiment 1). The variables that govern the development of such awareness are not well understood (see Ericsson & Simon, 1980), but they include the plausibility and observability of these processes, as well as attentional focus. Awareness is critical because it is a prerequisite for the conscious control of processes and outcomes.

Third, spontaneous trait and gist inferences are neither automatic (because they can be inhibited) nor controlled (because subjects are typically unaware of inferring them). So the automatic versus controlled dichotomy is inadequate for discussing the degree and kind of control that people have over spontaneous cognitive processes. They are uncontrolled but controllable, and their occurrence depends on other goal-directed, intentional processes (see Bargh, 1989, 1994, and Uleman, 1989, for further discussion).

Referents of STIs

Spontaneous trait inferences can refer to the person or merely to the person’s behavior. Our results indicate that STIs usually refer to behaviors rather than persons. For subjects in Experiment 3 with an impression formation goal, there was evidence of explicit memory links from the trait cues to actors, after controlling for indirect links from cues to actors through behaviors. These trait inferences were not spontaneous, however. Only subjects with the goal of judging behavioral similarity (also Experiment 3) produced some evidence of an explicit trait-to-actor link in memory (two-tailed \( p < .082 \)). Subjects apparently interpreted this goal as requiring attention to relationships between the actors’ occupational identities and their behavior. The other social judgment goal produced no such links.

How general is this result, that STIs are usually about behaviors rather than actors? We performed the contingent analysis of
actor recall described above on data from the simple memory condition of Experiment 1, and from Winter and Uleman (1984). Neither showed any evidence of explicit memory links between traits and actors.

This method may underestimate the relevance of STIs to actors, and vice versa, for three reasons. First, the only thing subjects knew about the actors was their occupations, so their knowledge was impoverished relative to more elaborate texts or most social settings. Richer knowledge structures about actors might provide more opportunities for links with trait characterizations of behavior. Second, these occupations were chosen for their irrelevance to the behaviors. Third, our tasks and materials provided little reason to activate whatever actor knowledge was available. For example, if the memorization task had included several behaviors performed by the same actor, and if these had been organized by actor (as in many social episodes), so that memory organization by actor was possible and natural, more trait-to-actor links might have occurred. As it was, encoding “What’s his name lost his savings...” accomplished subjects’ goals almost as well as “The carpenter lost his savings...”. In short, neither our tasks nor materials facilitated explicit trait-to-actor links as much as we would expect in more complex and realistic tasks and social settings.

Recent research has begun to examine these suggestions. Uleman, Moskowitz, Roman, and Rhee (1993) showed that when the actor is presented visually, spontaneous trait inferences become more frequent. Yet they found no explicit memory links between traits and actors. Whitney, Davis, and Waring (1993) measured reading times for trait-implying sentences that were preceded by trait-consistent, inconsistent, or irrelevant information. Their results suggested that STIs are linked to actors only under impression-formation goals. However, Moskowitz (1993) showed that people with a high need for structure and memory goals do spontaneously create these explicit links, in a cued-recall paradigm. And Carlson and Skowronski (1993)—using a novel presentation procedure, more elaborate behavioral information organized by actors, and a more sensitive implicit memory measure—found clear evidence that links between spontaneous trait inferences and actors are established under a range of goals, including both memorization and forming impressions.

Other Spontaneous Inferences

Behavioral gist inferences were included in these studies because, like traits, they are inferences rather than mere semantic associates. They are clearly not precursors to trait inferences because they did not occur when the goal was semantic analysis, although STIs did (Experiment 2). Nor do they preclude STIs; gist- and trait-cued recall were either uncorrelated or positively correlated. Both kinds of inferences can co-occur spontaneously. Because they are behavioral gists, their effectiveness in retrieving sentence predicates is not surprising, but they were also effective actor cues for all the social judgment goals in Experiment 3, as seen in both Table 1 and in the conditional analyses of actor recall reported above. This suggests that spontaneous gist inferences are more likely to be linked to actors in memory than STIs. That is, at least with the current measures and goals, people are more likely to remember the gist of what the actor did than its trait implications.

The traditional cued-recall method of detecting spontaneous trait inferences compares trait-cued recall with both noncued recall (which should be lower) and semantic-cued recall (which should not be higher). This method can be used to detect any spontaneous inference that is not a strong semantic associate of words in the sentence. Other methods have been used to study the trait inferences, and they could be used for other spontaneous inferences as well. Bassili and Smith (1986) and Bassili (1989a) used word fragment completions of trait words, and Whitney and Williams-Whitney (1990) have shown that word stem completions are more sensitive measures. Roman, Uleman, Hon, and Moskowitz (1990) used recognition reaction times to demonstrate on-line STIs; see also Uleman, Hon, Roman, and Moskowitz (1993). STIs’ effectiveness as primes (Moskowitz & Roman, 1992) provides another method. And Carlson and Skowronski’s (1993) savings method could also be used for other inferences. All six are promising methods for studying the effects of goals on spontaneous social inferences.

Conclusion

Information-processing goals can have unintended and unconscious effects on social inferences and their referents. People are not always cognitive misers, doing less cognitive work than they intend or believe. They can also be cognitive philanthropists, going well beyond the information given and doing more cognitive work than they intend or believe they have done. Although people sometimes tell more than they have inferred (Nisbett & Wilson, 1977), they may also infer more than they can tell. One might say that, in the course of editing the feature film of conscious experience, many inferences appear only briefly in the daily rushes and then are left on the cutting room floor. Conscious goals shape the final film more closely than they control each of the elements that might (or might not) be useful in the end.

References


Bassili, J. N., & Smith, M. C. (1986). On the spontaneity of trait attri-


Uleman, J. S. (1987). Consciousness and control: The case of spontaneous-
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the ghosts in the machine. In J. S. Uleman & J. A. Bargh (Eds.), Unintended thought (pp. 287–305). New York: Guilford Press.

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