# Linking Versus Thinking: Evidence for the Different Associative and Attributional Bases of Spontaneous Trait Transference and Spontaneous Trait Inference

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Informants who describe others' behaviors are perceived as having more of the trait implied by the behavior they describe (the trait transference effect). Associative and attributional explanations for this phenomenon are reviewed and examined in 3 experiments. Findings were inconsistent with attributional interpretations: (a) transference effects persisted with extended coding times, online judgments, and warnings to participants to avoid the effect; (b) negativity effects were absent in transference but occurred with trait inference; and (c) transference effects failed to generalize beyond the particular trait implied by informants' descriptions. Moreover, forcing participants to recall the target of informants' descriptions just prior to trait judgments eliminated the transference effect while enhancing inference effects. These results contradict nonassociative explanations and indicate that different processes underlie spontaneous trait transference and spontaneous trait inference.

*Keywords:* spontaneous trait transference, spontaneous trait inference, impression formation, person perception, associationism

If Bart is described as kicking puppies, others perceive him as cruel. These *spontaneous trait inferences* (STIs) emerge both when actors describe their own behaviors and when their behaviors are described by third parties (e.g., Carlston & Skowronski, 1994; Carlston, Skowronski, & Sparks, 1995; Uleman, Newman, & Winter, 1992; Winter & Uleman, 1984; see Uleman, 1999, for a review). However, recent evidence suggests that Bart will also be perceived as cruel when he describes others' puppy-kicking behavior. That is, perceivers attribute traits to informants based on the behaviors they describe, even when the informants are not the perpetrators of those behaviors (Mae, Carlston, & Skowronski, 1999; Van Calster & Hoorens, 2002). The term *spontaneous trait transference* (STT) has been used to characterize this tendency (Skowronski, Carlston, Mae, & Crawford, 1998).

STT may be a consequence of implicit associative processes (Skowronski et al., 1998), whereas STI seemingly implicates more explicit attributional processes (Carlston et al., 1995). However, it is possible that attributional mechanisms also underlie STT. The primary goal of the present article is to delineate these different attributional and associational processes, to examine factors that may differentially affect such processes, and to obtain evidence for the specific mechanisms that underlie STT and that distinguish it from STI.

## Associative Versus Attributional Processes

We suggest that two types of processes can come into play during the encoding of behavior descriptions: associative ones and attributional ones. Associative processing can be characterized as a relatively shallow activity that yields generic, unlabeled linkages in memory (see Carlston & Smith, 1996) as a result of the spatial and temporal contiguity of activated constructs. Such processes are shallow in the sense that they do not implicate attributional knowledge structures that would help distinguish diagnostic associations from less diagnostic ones. We term the resultant linkages as "generic" and "unlabeled" because they tend not to incorporate retrievable tags (see the ACT* model; Anderson, 1993) that designate the relationship between activated constructs, as when one (usually a trait) is explicitly a property of the other (usually a person).

In contrast, attributional processing involves deeper, more elaborative mental activity that implicates attributional knowledge and rules, resulting in the formation of labeled associative linkages that designate one construct as a property of another. Such processing does not require conscious and intentional analysis, only the activation and use of attributional knowledge. As a consequence, such processing is likely to reflect the general principles and phenomena described by classic attribution theories (e.g., Heider, 1958; Jones & Davis, 1965; Kelley, 1967).

The mental representations produced by associative and attributional processing should differ in two respects: the strength of the

linkage between person and trait, and the extent to which that linkage is implicitly labeled with "has the property of" rather than simply "is associated with." Because they involve little elaboration, associative processes will generally produce weak links in memory. Because they do not derive from knowledge that would specify the nature of the linkage, those links will be unlabeled. In contrast, attributional processes will generally create stronger linkages than associative ones, and such linkages are more likely to be labeled in a manner suggesting that the trait is actually a property of the person.

Attributional processing and associative processing may also differ in other ways. For example, attributional processing might sometimes be a controlled process, with such features as awareness, intentionality, and capacity utilization (see Bargh, 1984). However, attributional processes can also be so well learned that they proceed relatively automatically (Carlston & Skowronski, 1994; Gilbert, Pelham, & Krull, 1988; Trope & Alfieri, 1997). In contrast, associative processes probably occur automatically most of the time but may sometimes occur in a controlled manner, as when people engage in rote memorization. Consequently, although we would characterize attributional processing as generally more controlled than associative processing, we maintain that the critical differences lie in the depth of processing, the extent to which attributional knowledge comes into play, and the degree to which the formed linkage is labeled to indicate that the trait is a property of, and not merely associated with, an individual.

Before elaborating on the possibility that STT inference involves associative processing and STI involves attributional processing, we briefly review the histories of these phenomena. We then discuss theoretical and empirical differences between them, and consider alternative explanations for STT findings.

### Spontaneous Trait Inferences

There was once considerable debate over whether perceivers spontaneously inferred actors' traits from their behaviors (Bassili, 1993; D'Agostino & Hawk, 1998; Duff & Newman, 1997; Fiedler & Schenck, 2001; Fiedler, Schenck, Watling, & Menges, 2005; Ham & Vonk, 2003; Krull, 1993; Lupfer, Clark, & Hutcherson, 1990; Moskowitz, 1993; Moskowitz & Roman, 1992; Newman, 1993; Otten & Moskowitz, 2000; Rhee, Uleman, Lee, & Roman, 1995; Uleman, Hon, Roman, & Moskowitz, 1996; Zarate, Uleman, & Voils, 2001; Zelli, Huesmann, & Cervone, 1995; Zelli, Cervone, & Huesmann, 1996). There is now considerable evidence that they do (see Uleman, Newman, & Moskowitz, 1996, for a review). Our contribution to this literature (Carlston & Skowronski, 1994; Carlston et al., 1995) was to demonstrate that perceivers were better able to learn actor–trait associative pairs if they previously had been exposed to a description of the actor's trait-implying behavior. This *savings-in-relearning effect* suggests that a trait concept can be activated during the encoding of the behavior and then spontaneously linked to the mental representation of the actor (for additional evidence on such linkages, see Todorov & Uleman, 2002, 2003, 2004). Later studies indicated that these actor–trait linkages lead the informant to be rated more extremely on scales relating to the described behavior (Skowronski et al., 1998; Experiments 2 and 4). In other words, actors are ultimately attributed the traits implied by their behavior descriptions.

To some extent, the precise mechanisms underlying STI remain unclear (Uleman, Moskowitz, Roman, & Rhee, 1993). In general, however, it has been suggested that STIs are primarily an encoding phenomenon (Moskowitz & Roman, 1992; Newman & Uleman, 1990) that depend on an impression formation goal (Uleman & Moskowitz, 1994) and that may require cognitive capacity (Uleman et al., 1992). The implication is that STIs reflect controlled attributional processes that perceivers engage in as they encounter trait-implying behaviors (but see Carlston & Skowronski, 1994, and Gilbert, Pelham, & Krull, 1988, for evidence that such processes may become automatized).

We contend that because STIs involve attributional processing, they should reflect the basic tenets of such processes, as described in attribution theories (Heider, 1958; Jones & Davis, 1965; Kelley, 1967). For example, all of the major attribution theories suggest that attributions made from negative behaviors, which are relatively uncommon and non-normative, should tend to be stronger than those made from positive behaviors, which are more common and consequently, less diagnostic (Reeder & Brewer, 1979; Skowronski & Carlston, 1987, 1989). Thus, to the extent that attributional knowledge is accessed during inferential processes, negativity effects would be expected to emerge. And indeed, empirical research on attributional judgments has frequently demonstrated such effects (see Rozin & Royzman, 2001; Skowronski & Carlston, 1989). On the other hand, associative processes presumably do not draw on attributional knowledge regarding behavior diagnosticity, so there is little reason for such processes to produce negativity effects.[1]

### Spontaneous Trait Transference

STT is less sensible than STI. Behaviors communicated about others seem more informative about those others than about the informant. To explain transference, we (Mae et al., 1999) proposed a model that involves three steps: (a) traits are activated during the interpretation of described behaviors, (b) those activated traits become associated with people present during Step 1, and (c) associations created by Step 2 implicitly influence trait impressions of those people. Thus, when an informant reports the behavior of someone else, the informant is present as that behavior is interpreted, associated with any traits it implies, and then perceived as having the implied traits.

The first step of this model draws on work by Bassili (1989) suggesting that trait concepts are activated during the process of interpreting behaviors. Just as Bassili suggested that these activated traits become associated with actors, we suggest that they become associated with informants who are describing others' behaviors. Consequently, when Bart describes someone else's kicking of a puppy, Bart becomes implicitly associated with the cruelty implied by that act. It is important to note that according to the model, this association does not reflect trait judgments or

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[1] Of course, if a situation allowed differential attention to differently valenced information, then greater attention to negative information (Fiske, 1980; Smith, Cacioppo, Larsen, & Chartrand, 2003) rather than attributional considerations, could lead to stronger associations with negative material. However such situations have rarely been employed in the literatures described here.

attributions, it is simply a consequence of the simultaneous activation of trait and person.

For such associations to influence explicit inferences of the informant's traits, participants must forget or ignore the other-descriptive nature of the remarks underlying the association, treating that association instead as though it reflects informant characteristics. This disregard for specific, qualifying details of the original stimulus event is related to findings in the source confusion literature (see Mitchell & Johnson, 2000; Macrae, Bodenhausen, & Calvini, 1999) and also parallels people's disregard for episodic memories when making trait judgments about an actor (see Budesheim & Bonnelle, 1998; Carlston, 1980; Carlston & Skowronski, 1986; Sherman & Klein, 1994). We suggest that in the absence of attributional processing, associations involve "unlabeled links" that convey little about the nature of the underlying relationship. Hence, in the STT paradigm, when trait ratings are solicited for each photo, perceivers may simply have a "gut feeling" that reflects their previously formed person–trait associations. We term this the *implicit effect* hypothesis, to suggest that perceivers may be largely unaware of the source of their person–trait associations. To reinstate our ongoing example, Bart's association with cruelty can ultimately transform into the sense that Bart is cruel, or at least, crueler than he otherwise would have been viewed, without perceivers recalling anything about anyone kicking puppies.

## Comparing STIs and STTs

Both STI and STT have been shown to affect perceivers' ultimate perceptions of informants' traits. However, our analysis suggests that different processes are involved in these phenomena and that these processes result in different representations that can have different consequences. Specifically, if STI is an attributional process, then (a) it should tend to involve deeper and more elaborative processing, (b) which depends more on processing goals and available cognitive capacity and (c) which produces stronger and more enduring person–trait associations (d) that involve labeled links, indicating that the trait is a property of the person, and (e) this should be especially true for traits implied by negative behaviors. In contrast, if STT is an associative process, then (a) it should tend to involve relatively shallow processing, (b) which depends less on processing goals and available capacity, (c) resulting in weaker associations (d) that are unlabeled and (e) unaffected by the valence of stimulus behaviors.

Although little past work has directly contrasted STI and STT, there are some relevant data. For example, it appears that STTs are generally not as extreme as STIs and that they do not depend as much on processing goals or available cognitive capacity (see, e.g., Skowronski et al., 1998, Study 4). Several studies in that article provide additional evidence. In Study 3, participants were told that informants' self- and other-descriptive statements were actually fabricated by research assistants and randomly paired with informants' photographs. Skowronski et al. argued that this instruction removed all reasonable bases for making attributions about the persons in the photos. As predicted, other-descriptive statements continued to have a small but significant effect on trait ratings, just as they have had in previous STT studies. This suggests that STT participants were not engaging in attributional processing, so that discouraging such processing had no effect. In contrast, the random pairing instructions dramatically reduced the extremity of ratings made from self-descriptive statements (compared with most STI studies), though these were still significantly more extreme than in control conditions. This suggests that the random pairing instructions discouraged attributional inferences, weakening trait perceptions. However, simple associations between the informant photos and the implied traits apparently persisted nonetheless, resulting in small effects more like those ordinarily obtained for STT.

Skowronski et al.'s (1998) Study 4 has similar implications. Participants viewed videotapes of informants describing themselves or others in which half of the participants told that some informants were lying and that it was their job to detect the liars. This deception-detection instruction presumably occupied cognitive capacity, making it more difficult to engage in attributional processes. As a consequence, the instruction reduced the extremity of trait judgments that participants made from self-descriptions, although it had no effect on trait judgments made of informants who described others. Again, the implication is that the STIs formed from self-descriptions involve capacity-using attributional processes, and that these were interfered with, whereas simple associative processes were not.

## Alternative Explanations for STTs

The current research attempts to establish with greater certainty that STIs and STTs implicate different processes, with the former being attributional and the latter being associative. We hypothesize that associative processing ultimately has implicit effects, without implicating any attributional mechanisms. However, alternative explanations for STT have been proposed that posit attributional mechanisms, either during encoding or recall. All of these processes are summarized in Table 1.

Table 1
*Hypothesized Mechanisms Underlying Spontaneous Trait Transference*

| Mechanisms | Encoding processes | | Retrieval processes | | Outcome |
|---|---|---|---|---|---|
| Associative | Associative processing | → | Implicit effect | | |
| Attributional | Assumed approval<br>Assumed similarity<br>Perceived likeability<br>Inaccurate encoding | → | Accurate retrieval | → | Spontaneous trait transference |
| Mixed | Associative processing | → | Inaccurate retrieval | | |

## Encoding Processes

One alternative explanation for STT is that perceivers engage in attributional processing, as though informants had described themselves, because they are confused about who descriptions pertain to. In an effort to prevent such confusion, our research has always varied the gender of the informant and the person being described (e.g., male participants describe a female participant's behavior using female pronouns) as a constant reminder that the informant is not describing his own acts. Nonetheless, it is theoretically possible that research participants might be so distracted or indifferent that they overlook the non-self-descriptive nature of the stimulus communications. We term this the *inaccurate encoding* hypothesis.

Additionally, perceivers might attribute traits to an informant because of logical implications of the descriptive act. For example, in the absence of explicit statements of disapproval, informants might be presumed to approve of behaviors they describe. Thus, if Bart describes another's act of cruelty, it may imply that he is the kind of cruel person who would engage in such acts, or at least enjoys them when others do so. We label this the *assumed approval* hypothesis. Another possibility is that Bart is assumed to be similar to the friends or acquaintances he describes. Because people tend to associate with similar others (Dunn & Cutting, 1999; Kubitschek & Hallinan, 1998; Urberg, Degirmencioglu, & Tolson, 1998), the informant's description of a friend's behavior may be viewed as subtly self-descriptive. Thus, if Bart knows cruel people, it may imply that he is cruel himself. We term this the *assumed similarity* hypothesis. Both the assumed approval and the assumed similarity hypotheses imply that the descriptions induce participants to make spontaneous trait attributions about informants, and that these are specific to the trait implied by the description.

In contrast, a third possibility leads only to a general evaluative halo, which is not specific to the trait described. This attributional process centers on the assumption that those who describe others positively are likable and those who describe others negatively are not. Thus if Bart disparages someone by describing her puppy-kicking behavior, then Bart must not be likable. Such perceptions of likability or lack of likability depend only on whether the act is complimentary or critical, not on the particular attribute implied by the description. Hence, attributions made from the informant's act are not likely to be specific to the trait dimension described but rather should generalize across a range of traits associated with being likeable or not likeable. We term this the *perceived likeability* hypothesis.

## Recall Processes

If perceivers make attributions regarding an informant's traits, the veridical recall of these attributions should be sufficient to produce STT. For example, inaccurate encoding or assumed approval could lead Bart to be viewed as cruel, and accurate recall of this initial attribution would logically produce the trait ascriptions characteristic of STT effects. However, even if perceivers initially process other-descriptions associatively without making initial attributions about the informant, they might later engage in attributional processes if they misremember other-descriptions as having been self-descriptive. People often will forget an information source before they forget the information itself (Betz, Skowronski, & Ostrom, 1996; Macrae et al., 1999; Mitchell & Johnson, 2000; Underwood & Pezdek, 1998). Thus, perceivers might forget who an informant described, and might assume that their trait associations stem from self-descriptive behaviors. We term this the *inaccurate retrieval* hypothesis.

Evidence for this hypothesis is provided by Skowronski et al. (1998), who found in their Study 2 that participants misrecalled other-descriptions as having been self-descriptive 45.8% of the time. However, other experiments have demonstrated STT using manipulations that should have minimized both inaccurate encoding and inaccurate recall. For example, these included the following conditions: (a) those in which participants encountered only informants who described others (Mae et al., 1999); (b) those in which the encoding time was not limited (Skowronski et al., 1998; Study 4); and (c) those that utilized a relatively short delay between presentation of the descriptions and the trait rating task (Mae et al., 1999). The fact that transference occurred under such conditions is inconsistent with the inaccurate encoding and memory hypotheses.

## Negativity Effects

We have already noted that attributional processes are frequently characterized by negativity biases. Consequently, if STT is due to one of the attributional alternatives described here, then transference effects should be stronger for negative than for positive behaviors. For example, because informants' descriptions of their own negative behaviors are generally perceived as highly diagnostic, resulting in strong attributional ratings, similar effects should obtain when informants are only *mis*perceived as having described themselves (inaccurate encoding mechanism). Similarly, it should be highly diagnostic when informants are perceived as approving of negative behaviors or as being similar to people who engage in them (assumed approval and assumed similarity mechanisms). Finally, people should be evaluated more harshly for speaking ill of others (an unusual, nonconsensual, and diagnostic act) than they are positively for speaking well of others (a normative, consensual, and nondiagnostic act; perceived likability mechanism). Consequently, regardless of the exact mechanism involved, attributional approaches to trait transference imply that the same negativity effects should be obtained for transference as are typically obtained for other attributional judgments. In contrast, if we are correct that STT is an associative process, and not an attributional one, then descriptions of others' positive behaviors should produce trait impressions that are essentially as strong as those produced by descriptions of others' negative behaviors.

## Overview

The three studies that are reported in the present article attempt to clarify the processes underlying STI and STT. We hypothesized that STI reflects attributional processes, whereas STT reflects associative processes. Thus, we suggest that STT does not reflect the attributional explanations we have termed inaccurate encoding, inaccurate retrieval, assumed approval, assumed similarity, or perceived likeability. Although some evidence against these latter hypotheses has already been described, it is mostly indirect, originating in experiments that focused primarily on other issues. We

address these possibilities more directly by examining the impact of various manipulations on trait judgments made by informants who describe themselves versus those who describe others. In all three studies, we also examine the occurrence of negativity effects with both kinds of stimuli as well as the specificity of transference effects across different trait ratings. The ultimate goal is to provide converging evidence that STT reflects associative processes differing from the attributional ones underlying STI.

## Experiment 1

The first experiment assesses the possible role of inaccurate encoding in STT by varying the time that participants are given to process behavior descriptions. In most past work on STT, participants have been exposed to behavior descriptions for very brief intervals, which seemingly increases the likelihood that errors may be made in encoding them as either self- or other-descriptive. One study (Skowronski et al., 1998; Study 4) did provide for more leisurely study times, but that study did not compare the magnitude of transference effects in different encoding time conditions.

Accordingly, in one condition of Experiment 1 the time allotted for participants to look at each informant's photo and read the accompanying behavior description was limited to 10 s (close to the interval in previous studies). In a second condition, participants had 20 s to complete these tasks. Later, all participants rated the informant on several personality traits. If STT reflects inaccurate encoding processes, doubling processing time to 20 s might reasonably be expected to reduce errors and, thereby, to reduce this effect.

In contrast, if trait transference reflects attributions based on assumed approval or assumed similarity, then the longer time interval might actually magnify the transference effect. Participants should have more time to engage in deeper, elaborative processing, specifically by inferring approval or similarity and then considering the implications of these. Finally, if trait transference reflects associative processes, it should persist with longer processing times, and it might even increase if extra processing time strengthens the informant–trait association.

This experiment also allows the various attributional interpretations to be distinguished from our associative model through the presence or absence of negativity effects. As discussed earlier, attributional processes ordinarily favor negative behaviors over positive ones, whereas behavior valence is essentially irrelevant in associative processing. Finally, the experimental design permits assessment of the trait specificity implied by all explanations except for the perceived likeability hypothesis, which predicts a broad halo effect across all evaluative traits. This explanation would be discredited by results showing that descriptions of others' behaviors primarily affect perceptions of the informant on the specific trait implied by the description.

## Method

### Participants

Participants were 79 undergraduates enrolled in an introductory psychology course who chose to be in the study and who received partial course credit for their participation.

### Procedure

This study used materials and procedures derived from Skowronski et al. (1998).

*Initial instructions.* Participants were told that they would be shown photographs of many different people, each paired either with a self-description of his or her own behavior or with a description of the behavior of an acquaintance. Participants were further told that these behaviors were culled from longer statements that the persons in the photos had provided in response to questions from an interviewer. Finally, participants were instructed to familiarize themselves with the photos and accompanying information, under the guise that such materials would be used later in the experiment. No instructions were given that would lead participants to try to understand or form impressions of the informants or their behaviors.

*Exposure task.* The exposure task exposed participants to informant photos and remarks, providing the opportunity for spontaneous inferences to be made about self-describing informants and for spontaneous informant–trait associations to be formed for other-describing informants. The color photographs were $4 \times 6$ head-and-shoulder shots that depicted a variety of students and that were taken in various locations around the Purdue University campus.

Twelve statements in each booklet strongly implied a personality trait (for pretesting details, see Carlston & Skowronski, 1994). In addition to these 12 *implied-trait trial*s, each booklet contained 17 filler photo-description pairs. The statements used in these pairs were also pretested in earlier research and found not to have reliable trait implications. The filler statements were designed to prevent participants from falling into a pattern of trying to guess the trait implications of each presented statement. Three filler pairs were presented at the beginning, two at the end, and the remaining were interspersed among the implied-trait pairs.

Some photos in each booklet were randomly selected to be self-informants and were paired with descriptions using first-person pronouns (e.g., "I did this"). Photos selected to be other-informants were paired with descriptions using third-person pronouns (e.g., "She did this"). To emphasize that these statements were not self-descriptive, other-informants always used pronouns of a different gender than their own (e.g., male informants always described female participants).

A counterbalancing scheme was used to create four separate stimulus booklets that varied on two dimensions. The first dimension involves the particular photos used; two booklets used one set of 12 photos, and the remaining two used a different set of 12 photos. (The photos paired with neutral stories were always the same.) The second dimension involves the traits implied by the behavior descriptions. Twenty-four traits were used overall, with 12 being positive and 12 being negative. Each booklet contained statements that pertained to six of the positive traits and six of the negative traits. Half the statements of each valence were worded as self-descriptions and half as other-descriptions. Additionally, booklets were designed so that statements that were self-descriptions in one booklet set were other-descriptions in the other set. These counterbalancing procedures ensured that experimental results were not affected by the unique effects of individual photos, descriptions, or photo-description pairs. In addition, trait valence is unconfounded with other factors so that it can be included as a variable in all analyses.

*Encoding time manipulation.* Participants were paced through the 29 pages of the stimulus booklet via an audiotape. For some participants, the tape allowed 10 s of viewing time per page; for other participants, the tape allowed 20 s of viewing time per page.

*Confusion task.* Next, participants completed a confusion task designed to interfere with explicit memory for the descriptions. This task involved reading 30 pairs of behavioral descriptions and judging which of each pair described the more likeable person. An audiotape was used to pace participants through this task, allowing 30 s of viewing/response time per pair.

*Trait rating task.* Two days after the exposure task, participants rated the traits of 24 photographed individuals in a single random order. Each

participant had previously viewed only 12 of these photos, each paired with a trait-relevant statement. The 12 previously unseen photos were ones paired with trait-relevant descriptions in the other set of booklets. Ratings of these photos thus control for any trait inferences due to target appearance.

Participants rated the extent to which they thought each photographed individual possessed each of three traits on unipolar scales that ranged from 1 (*not at all*) to 7 (*extremely*). These three traits were the same regardless of whether the photograph was previously seen accompanied by a description (an *experimental trial*) or not (a *control trial*). Of the three, one (the *implied trait*) was implied by the description accompanying the photo on the experimental trial. The other two traits were denotatively unrelated to the implied trait, but one was *evaluatively congruent* with it and the other was *evaluatively incongruent* with it. Each trait concept was rated three times by each participant, once as an implied trait, once as an evaluatively congruent trait, and once as an evaluatively incongruent trait.

## Results and Discussion

### Ratings of Traits Implied by an Informant's Description

Each participant rated three informants in each of the four cells of the Trait Valence × Description Target design. Ratings of these three informants on the implied trait dimension were averaged and the four resultant scores filled out the implied trait cells of the experimental design. In addition, each participant provided ratings of 12 control photos, which were allocated to the four control conditions of the experiment based on the descriptions that accompanied them in the other booklet, where they appeared on experimental trials (as described in the *Method* section.) Again, ratings of the three photos within each cell were averaged for each participant, and the four resultant scores filled out the control cells of the experimental design. The eight computed averages were then used in a mixed analysis of variance (ANOVA) that included encoding time (10 s, 20 s), description target (self, other), trait valence (positive, negative), and experimental condition (experimental, control), with repeated measures on the last three variables.

*Trait transference and trait inference.* Mean trait ratings, shown in Table 2, confirm the occurrence of both STI (for self-informants) and STT (for informants who described others): Compared with control conditions, informants were judged to have relatively more of the traits implied by the behaviors they described, $F(1, 77) = 41.77$, $p < .0001$. As hypothesized, the STI effect (self-informants) was larger than the STT effect (other-informants), $F(1, 77) = 4.23$, $p < .05$, though follow-up tests indicated that both were individually significant, $F(1, 77) = 32.25$, $p < .0001$, and $F(1, 77) = 5.10$, $p < .03$.

Notably, the Description Target × Experimental Condition interaction was not qualified by encoding time, $F(1, 77) = 0.82$, $p > .37$.[2] Moreover, a simple effects test on ratings of other-describing informants also revealed no interaction between encoding time and experimental condition, $F(1, 77) = 1.09$, $p > .30$. In other words, additional encoding time did not reduce the magnitude of the STT effect, discrediting the inaccurate encoding explanation for STT. Nor did additional encoding increase the STT effect, as might have been expected were the assumed similarity or perceived likeability hypotheses correct.

*Trait valence and trait judgment.* We hypothesized that STI ratings would reflect negativity effects but that STT ratings would not. This hypothesis was supported by a significant three-way

Table 2

*Experiment 1: Experimental Condition × Description Target × Trait Valence Interaction in Ratings of Implied Traits*

| Behaviors | Trial | | Effect |
| --- | --- | --- | --- |
| | Experimental | Control | |
| Self-descriptive behaviors | | | |
| | | | *Inference effect*[a] |
| Positive behaviors | 4.99 | 4.51 | +0.48 |
| Negative behaviors | 4.16 | 3.28 | +0.88 |
| Overall | | | +0.68 |
| Negativity effect[b] | | | +0.40 |
| Other-descriptive behaviors | | | |
| | | | *Transference effect*[a] |
| Positive behaviors | 4.85 | 4.40 | +0.45 |
| Negative behaviors | 3.46 | 3.32 | +0.14 |
| Overall | | | +0.30 |
| Negativity effect[b] | | | −0.31 |

[a] Inference and transference effects refer to the experimental–control difference. [b] The negativity effect represents the difference between an inference or transference effect for negative behaviors and the same effect for positive behaviors.

interaction involving trait valence, description target, and experimental condition, $F(1, 77) = 6.34$, $p < .02$. As shown in Table 2, negative self-descriptive behaviors produced larger inference effects than did positive self-descriptive behaviors (producing a marginal Trait Valence × Experimental Condition interaction, $F(1, 77) = 3.26$, $p < .08$, whereas no such negativity bias obtained for informants who described others. In fact, there was actually a nonsignificant tendency for negative other-descriptive behaviors to produce smaller transference effects than positive other-descriptive behaviors, $F(1, 77) = 2.29$, $p < .14$. Assuming that negativity effects indicate attributional processing, this pattern suggests that attributional processes may underlie STIs but not STTs.

### Comparing Ratings of Implied and Nonimplied Traits

To simplify comparison of implied and unimplied (evaluatively congruent and incongruent) trait ratings, difference scores were computed for each by subtracting participants' mean rating on the three control trials in each cell from their mean rating on the three corresponding experimental trials. Positive scores thus indicate that informants who described behaviors were rated as having more of each trait than were controls. The difference scores were then entered into an ANOVA that included encoding time (10 s, 20 s), trait rated (implied trait, evaluatively congruent, evaluatively

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[2] There was, however, a main effect for encoding time, $F(1, 77) = 4.02$, $p < .05$, reflecting that trait judgments were more extreme in the 20-s encoding condition ($M = 4.22$) than in the 10-s condition ($M = 4.03$). Notably, however, this main effect did not interact with experimental condition, $F(1, 77) = 0.33$, $p > .57$, indicating that increased encoding time resulted in more extreme ratings on control trials as well as on experimental ones. On control trials, this result is probably just an anomaly. If the effect is nonetheless assumed to be real on experimental trials, it is in the opposite direction from the reduced effects predicted by attributional explanations for transference effects.

incongruent), description target (self, other), and trait valence (positive, negative), with repeated measures on the latter three variables.

The perceived likeability hypothesis suggests that informants who say positive things about others will be better liked than those who say negative things, which should color ratings not only on implied traits but on evaluatively congruent and incongruent traits as well. However, as shown in Figure 1, the trait-rated main effect indicates that scores were much greater for implied traits than for either evaluatively congruent or incongruent traits, $F(2, 154) = 11.07$, $p < .0001$. Furthermore, the Trait Rated $\times$ Description Target interaction was not significant, $F(2, 154) = 1.66$, $p > .20$, indicating that this specificity held for both self- and other-informants.

The only other significant effects in this analysis were a description target main effect, $F(1, 77) = 4.17$, $p < .05$, and a Description Target $\times$ Trait Valence interaction, $F(1, 154) = 7.98$, $p < .006$. The main effect indicates that self-descriptions had more impact ($M_{diff} = .32$) than did other-descriptions ($M_{diff} = .11$). The interaction shows that negativity effects occurred in ratings of self-describing informants (positive trait $M_{diff} = .21$, negative trait $M_{diff} = .42$) but not in ratings of other-describing informants (positive trait $M_{diff} = .26$, negative trait $M_{diff} = -.04$). For other-describing informants, a positivity effect actually obtained, $F(1, 77) = 5.24$, $p < .03$, which is inconsistent with arguments that STT reflects the attributional processes that underlie STI.

### Summary and Implications

The results of Experiment 1 are most consistent with predictions derived from the associative transference mechanism for STT. The fact that increasing encoding time did not decrease the transference
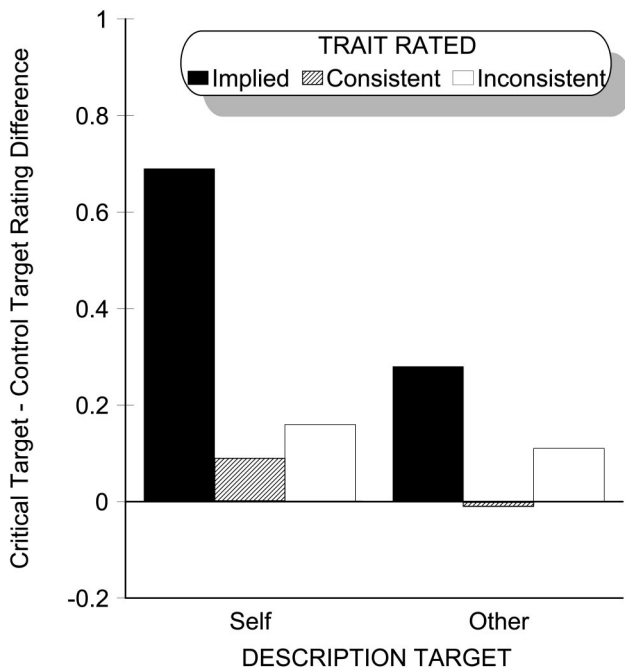


*Figure 1.* Experiment 1: Critical target–control target difference score means for the Description Target $\times$ Trait Rated interaction.

effect suggests that inaccurate encoding does not underlie the effect. The fact that transference effects were specific to traits implied by informants' descriptions suggests that the perceived likeability explanation for transference is not correct. The fact that description valence had different effects on judgments about self-describing informants than other-describing informants suggests that the former, but not the latter, reflect attributional processes that typically create negativity effects.

### Experiment 2

Experiment 2 provides another test of the inaccurate encoding and inaccurate retrieval hypotheses by radically reducing the likelihood of inaccuracies. Specifically, three steps were taken to ensure that participants could not become confused about the self- or other-descriptive nature of informants' descriptions. First, each participant was exposed only to self-describing or other-describing informants but not both. Second, participants made trait ratings online, trial by trial, with stimulus materials still before them so that there was no opportunity to forget the nature of the descriptions. Finally, participants went through the stimulus materials at their own pace, with no time constraints, to ensure adequate time for processing.

These procedures dramatically alter the judgment situation compared with that usually used to demonstrate STI and STT. In fact, the conditions involving self-descriptions cannot be characterized as involving "spontaneous" trait inference at all, as trait inferences are manded by the situation. However, these conditions still provide a useful comparison, as the deliberate inferential processes that are instigated are almost certainly "attributional" in the senses discussed in the introduction. Similarly, it is unclear whether trait transference effects in those conditions involving other-descriptions ought to be referred to as "spontaneous," as participants quickly become aware of the trait judgments they would be called upon to make. However, participants were presumably unaware of the impact that the other-descriptions had on their impressions of the informant, so that any transference was likely spontaneous, even if the formation of impressions was not. With these caveats in mind, we shall refer to trait impressions resulting from other-descriptions as STT, even within this novel paradigm, because the experiment was designed to explore the susceptibility of that effect to conditions where inaccurate processing is unlikely.

If trait transference still occurs under these circumstances, it is unlikely to reflect either inaccurate encoding or inaccurate retrieval. Instead, this would imply that transference occurs because person–trait associations have an effect that perceivers are unaware of, even with the stimulus in front of them. To further explore the occurrence of negativity biases in trait inference and transference, this study again assessed the effects of behavior valence on the judgments of self- and other-informants. Finally, to shed more light on the perceived likeability hypothesis, this study again examined the specificity of effects across implied and un-implied traits.

### Method

#### Participants

Participants were 65 undergraduates in an introductory psychology course who chose to be in the study and who received partial course credit for their participation.

## Materials and Procedure

Except as noted, the materials, instructions, and procedure were identical to those used in Experiment 1. One change is that the stimulus materials were rearranged into three booklets, each consisting of 24 pages. In the control condition, the pages contained only photographs of people. In the other-informant condition, each page contained a photo paired with that person's alleged description of someone else's behavior, described with third-person pronouns differing in gender from the informant. In the self-informant condition, each page contained a photo paired with that person's alleged self-description, described with first-person pronouns. The trait-implying descriptions were ordered identically in the latter two booklets.

A second procedural alteration involved the trait ratings task. Participants in the study were asked to look at the materials on each page of the booklet and to immediately provide trait ratings of the person in each photo while the stimulus was in front of them. Participants were told that once they had made their ratings and had turned the page, they were not to go back. A third procedural change involved processing time, as the task was completely self-paced.

## Results and Discussion

### Ratings of Traits Implied by an Informant's Description

Each participant's ratings of the traits implied by stimulus descriptions were averaged separately for the 12 positively described and the 12 negatively described informants. These averages were computed across the same subsets of stimulus photos whether those photos were presented with self-descriptions, other-descriptions, or no descriptions. The averages were then used in a Description Target (self-description, other-description, no description control) × Trait Valence (positive, negative) ANOVA with repeated measures on the latter variable.

*Trait inference and trait transference.* As shown in Table 3, self-describing informants were strongly perceived as holding the traits implied by their descriptions, compared with control conditions, and other-describing informants were in between, producing a significant description target main effect, $F(2, 62) = 37.77$, $p < .0001$. Tukey's tests ($\alpha = .05$) indicate that all pairwise comparisons were significant, signifying the presence of both a strong spontaneous inference effect (self-description condition) and a modest spontaneous transference effect (other-description condition). The latter effect was more robust than in previous studies, despite the many steps taken to ensure that neither source confusion nor forgetting occurred. This argues against both the inaccurate encoding and inaccurate retrieval explanations for transference.

*Trait valence and trait judgment.* The results of the analysis also yielded a significant trait valence effect, $F(1, 62) = 109.38$, $p < .0001$. As shown in Table 3, trait ratings of informants who described negative behaviors were more extreme relative to controls than trait ratings of informants who described positive behaviors. However, an interaction between trait valence and description target, $F(2, 62) = 3.15$, $p < .05$, indicates that this negativity effect was larger for self-describing informants than for other-describing targets. In fact, follow-up analyses reveal that the Trait Valence × Description Target interaction was significant for the former, $F(1, 42) = 8.07$, $p < .007$, but not for the latter, $F(1, 41) = 1.32$, $p > .26$. As in Experiment 1, then, negativity effects were obtained for self-informants (STIs) but not for other-informants (STTs).

### Ratings of Implied and Nonimplied Traits

Participants' ratings of informants on implied traits, evaluatively congruent traits, and evaluatively incongruent traits were averaged separately and entered into a 3 (Trait Rated) × 3 (Description Target) mixed ANOVA with repeated measures on the former variable. This analysis yielded significant effects for the trait rated, $F(2, 124) = 141.16$, $p < .0001$, for the description target, $F(2, 62) = 10.06$, $p < .0002$, and for the interaction between the two, $F(2, 124) = 32.93$, $p < .0001$. The means shown in Figure 2 reveal that self-descriptions and, to a lesser extent other-descriptions, had substantial impact on implied trait ratings, and considerably less impact on evaluatively congruent and evaluatively incongruent trait ratings. These data confirm that behavioral descriptions of both the self (STI) and others (STT) primarily affect the specific traits implied by the description, producing only a slight effect on other trait dimensions. Such results are incongruent with the perceived likeability explanation for transference effects, which predicts a general evaluative halo based on the complimentary or critical nature of speakers' remarks.

## Summary and Implications

Experiment 2 was designed to eliminate inaccurate encoding and retrieval by creating conditions in which such errors were unlikely to occur. Because participants only received self- or other-descriptions, and not both, and because they made their judgments online with stimuli in front of them, they should have readily encoded and recalled the nature of the descriptions. Yet,

Table 3

*Experiment 2: Trait Valence × Description Target Interaction in Ratings of Implied Traits*

| Behaviors | Condition | | | Inference effect[a] | Transference effect[b] |
|---|---|---|---|---|---|
| | Self description | Other description | Control | | |
| Positive behaviors | 6.56 | 5.53 | 4.56 | +2.00 | +0.97 |
| Negative behaviors | 5.95 | 4.67 | 3.44 | +2.51 | +1.23 |
| Overall | | | | +2.26 | +1.10 |
| Negativity effect[c] | | | | +0.51 | +0.26 |

[a] The inference effect represents the difference between self-description and control. [b] The transference effect represents the difference between other-description and control. [c] The negativity effect represents the difference between positive and negative behaviors.
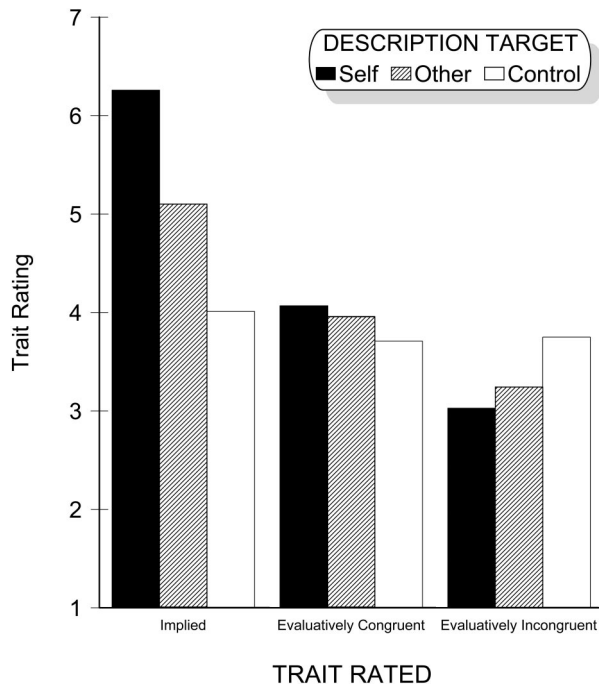
*Figure 2.* Experiment 2: Trait rating means for the Description Target ×
Trait Rated interaction.

even under these conditions, they engaged in STT, characterizing
informants in terms of traits implied by descriptions of others. This
suggests that transference is not a result of attributions made
because of inaccurate encoding of informant descriptions as self-
relevant, nor a result of associations misrecalled as reflecting
attributed characteristics.

As expected, this experiment also found negativity effects in
inferential (i.e., self-descriptive) conditions and not in transfer-
ence (i.e., other-descriptive) conditions. This replicates findings in Ex-
periment 1, although this time the effect in inferential conditions
achieved conventional levels of significance, and the effect in
transference conditions was in the same direction, albeit signifi-
cantly weaker and nonsignificant by itself. Finally, as in Experi-
ment 1, effects were found primarily for the trait implied by
informants' descriptions, contrary to the more pervasive halo pre-
dicted by the likeability hypothesis.

## Experiment 3

The third experiment introduced procedures designed to reduce
inaccurate retrieval and encourage accurate retrieval. Additionally,
this experiment was designed to shed light on the labeling of
person–trait linkages, whether those labels are recalled, and how
such recall affects the relative strength of STI and STT.

Two new manipulations were included to facilitate accurate
recall of the nature of informants' descriptions. The first consisted
of instructions provided to some participants that described STT
and urged them to avoid this error. Such instructions should
motivate participants to take into account the nature of the behav-
ioral descriptions (and thus, the nature of their informant–trait

associations), though it does not require them to actually recall
such information. The second manipulation specifically asked
some participants to report their recall of the self- or other-
descriptive nature of each informant's behavioral description be-
fore making judgments. This allows assessment of whether par-
ticipants' associations are labeled, and whether retrieval of those
labels eliminates trait transference. The two manipulations were
crossed to determine whether either or the two together would
have any effect on STT.

### Method

#### Participants

Participants were 214 undergraduates enrolled in an introductory psy-
chology course who volunteered in exchange for partial credit toward
fulfillment of course requirements.

#### Procedure and Materials

The materials and procedures used in this study were the same as those
in Experiment 1, except for the new manipulations. First, participants
assigned to the *avoid error* group were given the following additional
instruction just before they made their trait ratings:
"One thing we have noticed is that participants in this study sometimes
fail to take the target of the communication into account when making trait
judgments. You may recall that in the materials you read in the very
beginning of this study, some of the photographed individuals described
themselves, whereas others described an acquaintance. What sometimes
happens is that when an informant describes someone else's behaviors,
people later forget that the informant was describing someone else. So they
use the implications of the description to make judgments about the
informant, even though they shouldn't. We want you to avoid this error."
The other half of the subjects, in the *normal instructions* condition, were
simply instructed to provide the requested trait ratings. The second new
manipulation involved forcing some participants to recall the nature of
each description. Participants in the *forced recall* group were asked to
circle the target of an informant's description (self or other) at the top of
each page prior to rating each informant's traits. Participants in the *no
recall* group completed the same ratings in the same order, but were not
presented with the circling task.

### Results and Discussion

#### Ratings on Traits Implied by an Informant's Description

Mean ratings were calculated for each participant as in Exper-
iment 1. These means were entered into an Instruction (avoid error,
no instruction) × Recall (forced recall, no forced recall) × De-
scription Target (self, other) × Experimental Condition (experi-
mental, control) × Trait Valence (positive, negative) ANOVA
with repeated measures on the last three variables.

*Trait transference and trait inference effects.* The instructional
manipulation designed to encourage participants to avoid making
spontaneous transference effects had no effect whatsoever: There
were no effects or interactions involving this factor, largest $F(1,
210) = 1.48, p > .22$. In contrast, forcing recall of the target of the
original description had significant effects, as reflected in the
interaction among recall, description target, and experimental con-

dition, $F(1, 210) = 14.32$, $p < .0002$.[3] The means for this interaction, presented in Table 4, suggest that forcing recall of the description target increased the extremity of ratings made about self-informants and reduced the extremity of inferences made about informants who described others. The interaction between experimental condition and recall was significant for both self-informants, $F(1, 210) = 7.80$, $p < .006$, and other-informants, $F(1, 210) = 8.21$, $p < .005$. Moreover, pairwise comparisons among means ($\alpha = .05$) revealed that ratings of self-informants were significantly higher than ratings of corresponding controls, reflecting STI, regardless of whether participants were induced to recall the description target prior to making their ratings. However, for other-informants this comparison was significant only among participants not induced to recall the description target. Indeed, when recall was induced, the mean rating for other-informants was slightly lower than for controls, reflecting total elimination of STT effects.

Of interest, these results occurred despite the fact that overall recognition rates were quite poor. Participants were able to correctly identify the target of an informant's statement only slightly more often in the experimental condition (52%) than in the control condition (47%), $F(1, 106) = 6.52$, $p < .01$, and their accuracy was not significantly greater than chance (50%), $t(106) = 1.28$, $p < .15$. Moreover, though recall was significantly higher for self-descriptions (65%) than for other-descriptions (38%), as suggested by our discussion of labeled links, this difference was largely the result of a strong tendency for participants to guess that informants' statements were self-descriptive. Thus, the accuracy rate for control participants who never even read the statements revealed a similar pattern (61% and 32%, respectively).

The results of an additional regression analysis indicated that correctness of target recall nonetheless affected participants' trait ratings. Ratings of correctly recalled self-informants were significantly more extreme ($M = 4.96$) than those of self-informants who were incorrectly recalled as having described others ($M = 4.42$), $F(1, 603) = 4.34$, $p < .05$, though even the latter produced more extreme ratings than those obtained in control conditions ($M = 4.18$), $F(1, 389) = 3.95$, $p < .05$. In contrast, trait ratings for other-informants were essentially the same whether the other-descriptive nature of these was correctly ($M = 4.14$) or incorrectly

($M = 4.01$) recalled, $F(1, 606) < 1$, and neither reflected a transference effect when compared with the control mean of 4.11.

*Trait valence effects.* The analysis also revealed the now-familiar pattern between valence and trait judgments (shown in Table 5), producing a trait valence effect, $F(1, 210) = 454.92$, $p < .0001$, and a Trait Valence × Description Target × Experimental Condition interaction, $F(1, 210) = 14.32$, $p < .0002$. Ratings of self-informants show a negativity effect, with descriptions of negative behaviors having a greater impact on implied trait ratings than descriptions of positive behaviors. Follow-up tests indicate that this negativity effect is significant when analyzed separately, Experimental Condition × Trait Valence, $F(1, 210) = 5.53$, $p < .03$, but that other-informants show no such negativity effect. In fact, their descriptions of positive behaviors actually had slightly more impact on trait judgments than their descriptions of negative behaviors, although this interaction was not significant, $F(1, 210) = 1.33$, $p > .24$.

## Comparing Ratings of Implied and Nonimplied Traits

Participants' average ratings of self- and other-describing informants on implied traits, evaluatively congruent traits, and evaluatively incongruent traits were all adjusted by subtracting corresponding means on control trials as described for Experiment 1. These scores were entered into an Instruction (avoid error, normal) × Recall (forced recall, no forced recall) × Description Target (self, other) × Trait Rated (implied, evaluatively congruent, evaluatively incongruent) × Trait Valence (positive, negative) ANOVA, with repeated measures on the last three variables.

As shown in Figure 3, the experimental–control difference scores were much larger for the traits implied by informants' descriptions than for the evaluatively congruent or evaluatively incongruent traits, $F(2, 420) = 18.95$, $p < .0001$. Although this effect was qualified by an interaction with description target, $F(2, 420) = 4.75$, $p < .01$, a follow-up test indicated that it persisted (though only marginally) even for ratings of other-describing informants, $F(2, 420) = 2.55$, $p < .08$. An additional follow-up test indicated that the difference score for implied traits was significantly larger ($M_{diff} = .11$) than the average difference score for the evaluatively congruent and evaluatively incongruent traits ($M_{diff} = -.04$), $F(1, 210) = 4.46$, $p < .04$, reflecting more trait specificity than would be predicted by the perceived likeability hypothesis.

The omnibus analysis also yielded a significant interaction between trait rated, description target and recall, $F(2, 420) = 6.67$, $p < .002$, which qualified both a description target main effect, $F(1, 210) = 19.83$ $p < .0001$, and a Description Target × Recall interaction, $F(1, 210) = 7.75$, $p < .006$. As shown in Figure 4, forcing participants to recall the proper target of informants' descriptions principally affected implied traits, increasing these difference scores for self-informants but decreasing them for other-informants. The recall manipulation had relatively little impact on either evaluatively congruent or evaluatively incongruent traits.

This analysis also revealed a three-way interaction between trait rated, trait valence, and description target, $F(2, 420) = 6.67$, $p <$

Table 4

*Experiment 3: Experimental Condition × Description Target × Recall Interaction in Ratings of Implied Traits (Collapsing Across Valence)*

| Recall condition | Trial | | Effect |
| --- | --- | --- | --- |
| | Experimental | Control | |
| | Self-descriptive behaviors | | |
| | | | *Inference effect*[a] |
| No recall | 4.45 | 4.10 | +0.35 |
| Imposed recall | 4.76 | 4.01 | +0.75 |
| | Other-descriptive behaviors | | |
| | | | *Transference effect*[a] |
| No recall | 4.18 | 3.89 | +0.29 |
| Imposed recall | 4.03 | 4.11 | −0.07 |

[a] Inference and transference effects refer to the experimental–control difference.

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[3] The analysis also yielded significant effects for experimental condition, $F(1, 210) = 52.23$, $p < .0001$, description target; $F(1, 210) = 52.20$, $p < .0001$; and the interaction between the two, $F(1, 210) = 18.03$, $p < .0001$, all of which are qualified by the interaction described here.

Table 5

*Experiment 3: Experimental Condition × Description Target × Trait Valence Interaction in Ratings of Implied Traits (Collapsing Across Recall and No-Recall Conditions)*

| Behaviors | Trial | | Effect |
|---|---|---|---|
| | Experimental | Control | |
| *Self-descriptive behaviors* | | | |
| | | | *Inference effect*[a] |
| Positive behaviors | 5.08 | 4.67 | +0.41 |
| Negative behaviors | 4.12 | 3.43 | +0.69 |
| Overall | | | +0.55 |
| Negativity effect[b] | | | +0.28 |
| *Other-descriptive behaviors* | | | |
| | | | *Transference effect*[a] |
| Positive behaviors | 4.78 | 4.56 | +0.22 |
| Negative behaviors | 3.47 | 3.42 | +0.05 |
| Overall | | | +0.14 |
| Negativity effect[b] | | | −0.17 |

[a] Inference and transference effects refer to the experimental–control difference.

.002, which qualified a two-way interaction between trait rated and trait valence, $F(2, 420) = 6.67$, $p < .002$. As shown in Figure 5, these results again reflect a negativity effect for self-describing informants and a slight positivity effect for other-describing informants, each occurring only on the implied traits.

### Summary and Implications

These results have a number of interesting implications. First, they suggest that STT probably is a consequence of the implicit effects of previously formed associations. We suspect that in our paradigm, participants look at the cue photographs during the final
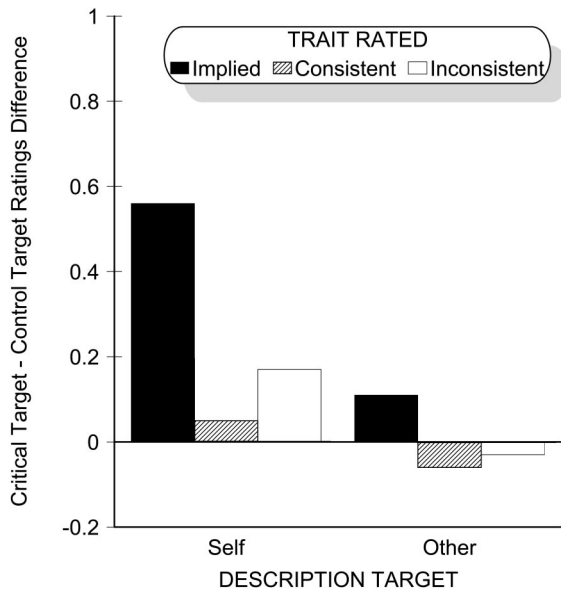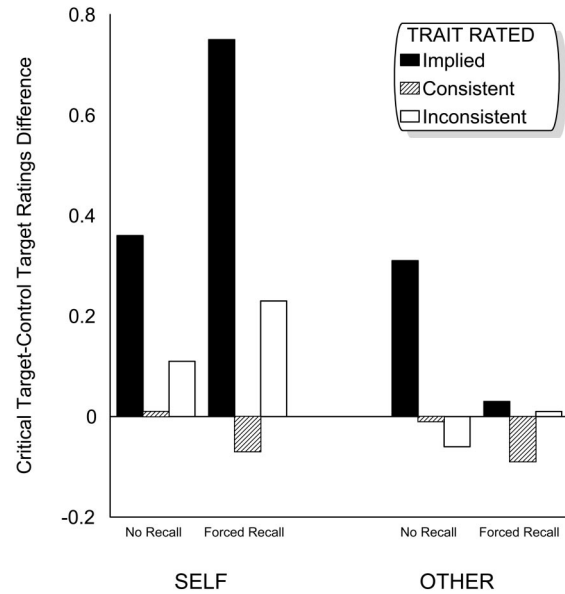


*Figure 4.* Experiment 3: Critical target–control target difference score means for the Description Target × Trait Rated × Recall interaction.

rating task and simply get a feeling that the pictured individual looks honest, smart, or whatever, without having any real sense of where that feeling comes from. Lacking awareness that it actually reflects an association formed from an informant's other-descriptive statements, they use their feeling to make trait judgments, even after being warned not to let such statements influence



*Figure 3.* Experiment 3: Critical target–control target difference score means for the Description Target × Trait Rated interaction.
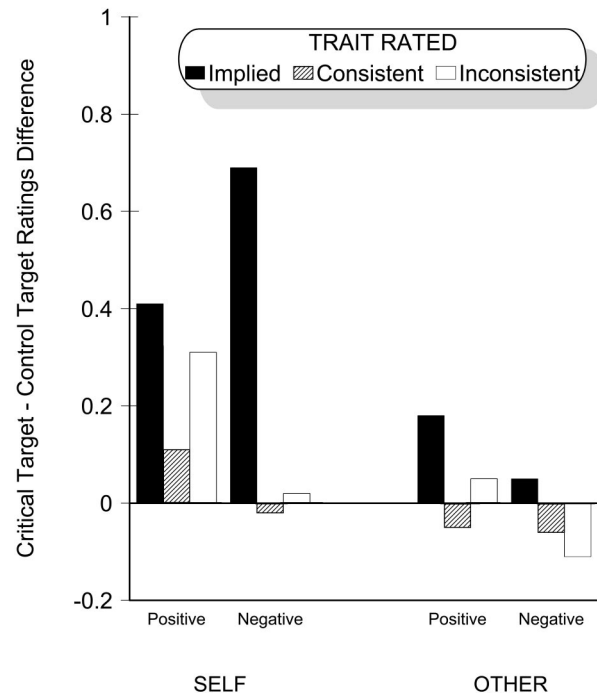


*Figure 5.* Experiment 3: Critical target–control target difference score means for the Description Target × Trait Rated × Trait Valence interaction.

them. Possibly the warning instruction causes them to be vigilant for tags labeling explicit memories as "other-descriptive" rather than "self-descriptive." We hypothesize, however, that such tags are not normally generated by purely associative processes. Moreover, the data indicate, at the very least, that such tags were irretrievable by participants, whose ability to recognize other-descriptive informants was actually less than chance (35% rather than 50%). Because they did not encounter the "other-descriptive" tags they were monitoring for, participants blithely went on making trait judgments using their implicitly derived feelings. We suggest further that the forced recall manipulation was successful in moderating STT because it emphasized to participants that their memories were poor and that they could not distinguish valid associations from invalid ones. In response, participants lowered their trait estimates a bit, negating the small influence that their weak associations would otherwise have had on them.

A second implication of these results is (again) that STI involves different processes than STT. Not only was STI affected by negativity biases that STT was not (as in Experiments 2 and 3), but STIs were also increased by the same forced recall manipulation that eliminated STT. It is unclear whether this was because memory for the self-descriptive nature of statements was relatively good (if only due to a guessing bias), or because the associations formed from such statements were much stronger than those formed from other-descriptive statements. Regardless, the result emphasizes that something quite different was going on with STIs than with STTs.

Finally, one piece of data might seem promising to those who favor attributional explanations for STT. Participants' tendency to guess that statements were self-descriptive (about twice as often as that they were other-descriptive) may seem to suggest that people do misremember their associations as attributed inferences rather than as simple associations. This would be consistent with attributional explanations such as inaccurate encoding or recall. Critically, however, STT effects were not obtained when participants mistakenly recalled other-informants as having been self-informants, as the inaccurate recall hypothesis argues. Combined with evidence from Experiments 1 and 2 that reducing encoding and recall inaccuracies fails to increase STT, the evidence seems to weigh against these attributional interpretations.

## General Discussion

### Explanations for Spontaneous Trait Transference

The results of the three experiments reported here provide no support for attributional explanations of trait transference. These experiments shed light on these explanations in several ways: (a) through manipulations that ought to affect attributional and associational processes differently; (b) through negativity biases that generally characterize attributional, but not associational, phenomena; and (3) through methods aimed at specific attributional explanations such as perceived likeability and inaccurate encoding. Each of these will be briefly reviewed.

Experiment 1 showed that increased processing time neither diminished trait transference, as one might expect if it were an encoding error, nor increased it, as one might expect if it reflects more time-consuming attributional processes. Experiment 2 further refuted the encoding error explanation by producing trait

transference under conditions where encoding errors should not generally occur—specifically, with stimuli that were clearly and uniformly other-descriptive, and with judgments made online, in the presence of the descriptive stimuli.

These results support the implications of previous research showing that transference effects are generally uninfluenced by manipulations that interfere with attributional processing. Thus, for example, Skowronski et al. (1998, Study 3) found that informing participants that photos and descriptions were randomly paired reduced STI (presumably an attributional process) but had no effect on STT. Similarly, they showed in their Study 4 that reducing cognitive capacity diminished STI but not STT. In general, the fact that STT is impervious to manipulations that ought to reduce attributions suggests that it is not an attributional process at all.

Additional evidence against attributional interpretations is provided by the valence effects demonstrated in all three of our experiments. We argued that negativity effects reflect the greater impact of diagnostic information on trait judgments when people engage in attributional processing. Consistent with this interpretation, we found negativity effects with attributionally relevant self-descriptive stimuli in all three of our experiments. However, we found no such effects with the attributionally irrelevant, other-descriptive stimuli underlying STT in any of these experiments. Moreover, the lack of negativity effects cannot be attributed to a lack of power stemming from the weaker nature of trait transference: The means in transference conditions were in the wrong direction in two of our three studies, reflecting (weak and nonsignificant) positivity rather than negativity. In our view, the divergence of valence effects in trait inference and trait transference suggests different underlying processes. Given past results that associate negativity effects with attributional processing, we interpret this divergence as supporting the nonattributional nature of STT.

Finally, our experiments provide evidence against the perceived likeability hypothesis, which suggests that we generally like those who compliment others and dislike those who criticize others. Across three different experiments, we found little evidence that people's remarks about others produced globally positive or negative reactions. Instead, the effects of such remarks appeared to be specific to the trait implications of the remarks that were made.[4]

The converging evidence against attributional interpretations of STT favors our associative interpretation (see Mae et al., 1999; Skowronski et al., 1998). This interpretation suggests that rather than making attributions about informants from their descriptions, perceivers simply associate the informants with the trait implications of those descriptions. We propose that these associations then have an implicit effect on later impressions. Because they lack awareness of the basis for these impressions, participants engage in transference even when the other-descriptive statements still lie in front of them (Experiment 2) or when they are warned not to let other-descriptive statements influence them (Experiment 3).

It should be acknowledged that in many cases, evidence for the associative nature of STT actually consists of evidence that STT does not involve attributional processes. To some extent this is

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[4] Note that we are not making the claim that differential liking responses to the informants do not occur; we merely note that such responses do not account for the trait transference effects that emerged in our experiments.

inevitable because the key differences between associations and attributions are features that characterize the latter but not the former. As described in the introduction, attributions involve greater elaboration, dependence on processing goals, use of cognitive capacity, labeled links, and conformity with attributional principles, whereas associations lack all of these features. Nonetheless, it would be useful for future research to find ways to more directly demonstrate and examine associative processing. This will not be easy, as many variables that should affect associative processing (e.g., conceptual knowledge relating behaviors and traits) should also affect attributional processing, and most measures of associative processing (e.g., savings in relearning) are similarly affected by attributional processing.

## General Implications for Trait Transference

The forced recall manipulation used in Experiment 3 is the first manipulation that we have found that eliminates the STT effect. Transference is otherwise very robust. Results presented in this article suggest that: (a) transference occurs even at very short stimulus-judgment delays and that (b) participants cannot consciously correct for the transference error simply by being warned of that error prior to making their judgments. These results confirm the robustness of transference observed in other research: It occurs when informants are observed on videotape, when they are familiar to the perceivers, and irrespective of perceiver processing goals (Skowronski et al., 1998; Mae et al., 1999).

Given this robustness, why does asking participants about the self- or other-referential nature of informants' remarks eliminate the effect (even when they mis-remember the informant as having self-described)? We suspect that their unsuccessful attempts to recall anything about other-informants' statements causes participants to distrust their intuitions about these informants and to moderate their judgments enough to offset the impact of their weak person–trait associations. Notably, simply warning participants about possible transference biases had no such effect, suggesting that it may be actual retrieval failure that leads to participants' caution. We (Carlston & Skowronski, 1986) have previously found evidence that priming behavioral memories can short-circuit the influence of primed concepts; analogously, searching episodic memory, even unsuccessfully, may short-circuit the influence of simple associations that might otherwise come into play. The issue of why the same recall manipulation produced the opposite effect for self-describing informants is discussed in the next section.

One implication of our findings is that transference is unintentional and nonconscious. The results of Experiment 3 support this conclusion, showing that transference was unrelated to the accuracy of target recall. Similarly, earlier results suggest that transference in not an encoding or retrieval error: The transference observed in Experiment 2 should not have occurred if it depended on mis-encoding or mis-recalling the nature of informants' descriptions. However, the efficacy of Experiment 3's recall manipulation in eliminating transference suggests that we are not inevitably doomed to be slaves to our associations. The forced recall manipulation apparently caused participants to be cautious in their trait ratings, at least in the absence of a strong memory that the informant described himself or herself.

## Implications for Spontaneous Trait Inference

Our data also have implications for the spontaneity of trait inferences made about self-informants. Some theorists (e.g., Bassili, 1989; Brown & Bassili, 2002; D'Agostino & Beegle, 1996; Whitney, Waring, & Zingmark, 1992) claim that spontaneous inferences about self-informants are not made during description encoding but that the description merely activates a trait concept. This trait concept might then be used to characterize the behavior (e.g., Jeremy did a talented thing) and may even be associated with the mental representation of the informant (as in STT). However, in the view of these theorists, the assignment of the trait to the informant (e.g., Jeremy is talented) does not occur until a trait inquiry is encountered, unless perhaps perceivers have an explicit impression formation goal.

The three experiments described in the present article are inconsistent with this conception of STI in two ways. First, several of our manipulations had different effects on impressions of self-describing and other-describing informants. Second, the pattern of valence effects in trait judgments differs for self-informants and other-informants, which implies that different processes underlie transference and inference. Such results illustrate the value of STT, not only as a phenomenon in its own right, but also as a possible proxy for purely associative processes. Thus, the same differences indicating that STT is not an attributional process also suggest that STI is not an associational one.

Finally, the recall findings in Experiment 3 are noteworthy in several respects. They provide little support for our premise that STI results in labeled linkages that identify person–trait associations as reflecting properties of the person. In fact, participants in this experiment showed only chance-level accuracy recalling whether informants had described themselves or others, meaning that they did not really know whether their associations reflected properties of the informant. However, they did tend to guess that their associations were based on self-descriptions more often than they guessed that these reflected other-descriptions. Moreover, when they guessed correctly, they then made a stronger trait inference, reacting as one would predict they would in response to an attributional "property" tag. Previous STI work has revealed significant accuracy on this recall measure, suggesting that person–trait associations may be labeled initially. Evidently, however, these labels can become irretrievable over time.

Notably, our results indicate that STI effects remain stronger than those produced by STT even when perceivers cannot accurately recall that informants described themselves. This is consistent with our hypothesis that the deeper and more elaborate processes involved in attribution produce stronger associations than do the shallower processes involved in simple association. When attributional labels can be recalled, we posit that these will operate in conjunction with stronger associations to produce relatively extreme trait inferences. Even in the absence of such labels, however, the representations produced by attributional work appear likely to have greater impact that those produced by associational processes alone.

## Final Thoughts

In addition to the issues already discussed, there are a number of other research directions that emerge from the findings described

in the present article. For example, STT might be one mechanism contributing to stereotype formation (Crawford, Sherman, & Hamilton, 2002), especially for role stereotypes. The logic is as follows: People who occupy some occupational roles must describe the trait-implying behaviors of others and might therefore run the risk of being "tainted" with implications of the behaviors they describe. Thus, lawyers and police officers might be seen as somewhat dishonest because they often describe dishonest people and events, psychologists might be perceived as crazier than others because of the people they regularly talk about, and so forth. A key question, then, is whether transference generalizes to groups, so that associations between specific informants and traits implied by their descriptions of others become linked to the social categories associated with those informants.

Our intuition is that police officers are not universally viewed as dishonest, or psychologists as crazy, implying that some sort of corrective process may occur. Perhaps perceivers realize that people in some roles must describe the trait-implying behaviors of others, and this foreknowledge might provide some protection against STT. If so, it would be interesting to explore the exact mechanism responsible, especially as our research suggests that simply knowing about transference errors is not sufficient to instigate corrective processes. With role stereotypes, however, preexisting knowledge (e.g., that police officers accuse and arrest criminals) or associations (e.g., between police officers and crime fighting) might (a) interfere with the formation of informant–trait associations or (b) cause those associations to be labeled with a "disclaimer" (as suggested by research on the discounting of persuasive messages). Such issues bear on the extent to which people's judgments are influenced by role-required behavioral descriptions and how that influence might be avoided.

More generally, research on such issues should shed light on the automaticity of the associations formed between informants and the traits implied by their descriptions. Ultimately, such work should help clarify the nature of trait inferences and associations, the circumstances under which each occurs, and the extent of their influence on social judgment and social information processing. The results of our research thus far suggest that these influences are both subtle and pervasive. However, the scope of these influences, and the conditions under which they occur, have yet to be determined.

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