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Seeing, but not thinking: Limiting the spread of spontaneous trait transference II ☆

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Abstract

When an informant describes trait-implicative behavior of a target, the informant is often associated with the trait implied by the behavior and can be assigned heightened ratings on that trait (STT effects). Presentation of a target photo along with the description seemingly eliminates these effects. Using three different measures of visual attention, the results of two studies show the elimination of STT effects by target photo presentation cannot be attributed to associative mechanisms linked to enhanced visual attention to targets. Instead, presentation of a target's photo likely prompts perceivers to spontaneously make target inferences in much the same way they make spontaneous inferences about self-describers. As argued by Todorov and Uleman [Todorov, A., & Uleman, J. S. (2004). The person reference process in spontaneous trait inferences. *Journal of Personality & Social Psychology, 87*, 482–493], such attributional processing can preclude the formation of trait associations to informants.

Keywords: Spontaneous trait inference; Attribution; Attention; Trait transference

Considerable research shows that trait inferences can be spontaneous, made without an explicit impression formation goal (Uleman, 1999; Uleman, Blader, & Todorov, 2005). Demonstration of these spontaneous trait inferences (STI) has often involved tasks apparently unrelated (from a participant's point of view) to inference-making. For example, Carlston and Skowronski (1994) found that learning photo-trait word associations were facilitated when the photographed person had previously been described as performing a behavior implying the trait word used in the association task. This occurred even when impression formation was not an explicit goal of the initial task. This *savings effect* suggests that spontaneous trait inferences are made during behavior encoding and are associated to the target.

However, Skowronski, Carlston, Mae, and Crawford (1998) showed a similar, but weaker, savings effect when traits were paired with photos of individuals who had described the trait-implicative behavior of someone else. In theory, this *spontaneous trait transference* (STT) effect also reflects the formation of an association between an informant and the trait implied by their description. However, this association does not reflect the same attributional processing underlying STI. Instead, it is thought to reflect a passive process in which people associatively link traits and informant photos when both co-occur. Nonetheless, the association influences trait ratings. Thus, Allison's descriptions of Nathan's lazy behavior would cause perceivers to both associate her with laziness and to view her as a bit lazy. These effects occur unbeknownst to participants and have been resistant to elimination (Carlston & Skowronski, 2005).

Recently, Crawford, Skowronski, and Stiff (2007a) showed that simultaneous depiction of informants and tar-

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gets eliminated the usual STT effects. That is, when a target photo accompanied the photo of an informant and the informant's description of the target's behavior, only the target photo, and not the informant photo, evinced facilitation in a trait-learning task (Study 1) and received more extreme ratings on the trait implied by the behavior (Study 2). However, such effects occurred only for other-informants. When a person described their own behavior, whether a photo of a third party was presented was irrelevant: Savings effects and inference effects to self-communicators (i.e., STI effects) occurred regardless.

There are at least two explanations for the elimination of STT effects by presentation of a target photo. One is that visual attention is directed toward targets and away from other-informants while processing behavior descriptions (Crawford et al., 2007a). This shift in visual attention could disrupt the conjoint presence of a trait and a representation of the informant, precluding the formation of an association between them. In fact, this attentional focus idea could also account for associations remaining strong to self-informants, even when a photo of a listener is presented. Bassili (1989; Brown & Bassili, 2002) argues that apparent evidence of STI can be explained by the same passive association process thought to underlie STT. Bassili's argument can be extended: People may preferentially attend to those who enact behaviors, regardless of whether they are self-informants or the targets of someone else's description. Such attention increases the chance that the trait activated by the behavior description will co-occur with a person representation causing formation of an association between the trait and person.

A second explanation for the Crawford et al. STT data is that presentation of a target photo in STT conditions instigates attributional processing about the target. One assumption in the usual STT conditions, in which a target photo is not presented, is that this attributional processing does not occur. Instead, a perceiver activates the trait implications of a behavior during encoding, and this activated trait can become associated with the other-informant. However, when a target photo is presented, attributional processing instigated by the presence of the target photo may override the associative processes that produce STT. This reasoning is consistent with results provided by Todorov and Uleman (2004). Their data suggest that attributional activity about one target precludes the formation of trait associations to a second target.

Overview of current studies

The two studies described in the present article attempted to disentangle these attentional and attributional explanations. Participants in both studies read behaviors accompanied by two photos. On *self-descriptive* trials, an *Acto*r described his or her own behavior to a *Bystande*r. On *other-descriptive* trials, an *Informant* described the behavior of the *Target*.

Study 1 used the Carlston and Skowronski (1994) relearning paradigm to assess person-trait association formation, but added an attentional cueing task. During behavior encoding, participants had to indicate orientation of a screen probe (up or down). The probe appeared in one of the positions occupied by one of the two photos. Rapid response latency to the probe should reflect the focus of a participant's attention. For example, if a participant disproportionately attends to the *Actor* instead of the *Bystander,* then a probe matching the *Actor's* screen location should generally be responded to rapidly.

The attentional hypothesis suggests that in STT conditions latencies to probes should be faster when the probe matches the screen position of the *Target* photo than the screen position of the *Informant* photo. In STI conditions, latencies to probes should be faster when the probe matches the screen position of the *Actor* photo than the screen position of the *Bystander* photo. This pattern of attention should fully explain the data expected on the savings measure: Greater savings to *Targets* than *Informants*, and greater savings to *Actors* than *Bystanders*. In contrast, the attribution position of Todorov and Uleman would predict some measure of independence between the attention and savings measures. That is, even if the attentional data matches the pattern of the savings data, the attentional measure should not account for all the variance in that savings measure.

Instead of using the savings measure, Study 2 assessed ratings of each individual on each trait implied by critical trait-implicative behaviors. Moreover, Study 2 included an eye-tracking measure to provide a continuous on-line measure of visual attention during encoding. Hypothetical data patterns predicted by the alternative theoretical positions duplicate those described for the savings and attention measures used in Study 1.

Additional data in Study 2 addresses the idea that inferences are made about *Actors* in STI conditions and *Targets* in STT conditions. Ratings of the targets on traits that are *congruent* with the critical target traits, and traits that are *incongruent* with the critical target traits, were also obtained. Carlston and Skowronski (2005) suggest that one signature of attributional processing is ratings generalization from a target trait. Evidence of generalization for *Targets* in STT conditions would suggest that the presentation of *Target* photos instigated attributional processing about those individuals.

Study 1: Attentional cueing and trait recall

Method

Participants and design

Fifty students enrolled in psychology courses at the University of Bristol participated. As compensation, they received credit toward a course requirement. The study was constructed as a 2 (Referent: self vs. other) × 2 (Behavior: trait-implying vs. neutral) × 2 (Speaker: speaker vs. non-speaker) within-subjects design.

Materials

Materials duplicated those used by Crawford et al. (2007a) and Crawford, Skowronski, Stiff, and Scherer (2007b). These included 48 photographs (250 × 345 pixels × 16 million colors) of Purdue University students who varied in age, gender (24 males and 24 females), and ethnicity. Thirty-six behavior descriptions were also used. Twenty-four implied a specific trait; 12 did not (see Carlston & Skowronski, 1994 for pretest ratings). The experiment was run on Dell Precision 360 PCs using InQuisit software. All instructions and materials were presented via computer.

Procedure

Encoding phase. In the first task, participants were presented with two photos and one behavior description. Participants were told that for some trials, one of the photographed individuals was describing his or her own behavior with another person present (*self-informant condition*), and that for some trials one of the individuals was describing the behavior of the other person who was shown (*other-informant condition*). In order to control for location, the speaker sometimes was on the right side of the screen, and sometimes on the left side of the screen. In order to make it clear who was talking about whom, on each first-person trial, the phrase, "What (s)he said about (her)himself" appeared above the actor. For the third-person trials, the phrase "What (s)he said about (him)her" above the informant.

The program instructed participants to read the behaviors and to look at the photographs in order to familiarize themselves with the types of materials that would be used in the study. These *familiarization* instructions (Carlston & Skowronski, 1994; Crawford et al., 2007a,b; Skowronski et al., 1998) were used because they explicitly avoid directing participants to form impressions of the photographed individuals and allow for trait inferences to occur spontaneously.

After presenting the instructions, the first behavior-photos trial appeared on screen. Each trial remained on screen for 12 s, followed immediately by the attentional cueing task (see below). As soon as the participant responded to the cue arrow, the next behavior-photos trial appeared on screen. This sequence continued until participants had viewed 28 photo pair/description combinations. The first two and last two combinations were fillers. On the other 24 trials, each participant read one of: six trait-implicative self-descriptions, six trait-implicative other-descriptions, six neutral self-descriptions, or six neutral other-descriptions. These 24 trials were presented in random order with the constraint that trait-implicative behavior trials were not presented consecutively. Counterbalancing schemes ensured that photos appearing on trait-implicative trials for some participants appeared on neutral trials for other participants, and that photos appeared in all four roles (*Actor*, *Informant*, *Bystander*, and *Target*).

Attentional cueing. At the end of each encoding phase trial, photos and behaviors disappeared from the screen. Either an upward or a downward arrow appeared in the same location previously occupied by one of the photos. Participants indicated via a key press the direction of the arrow (upward or downward). The latencies of these responses were recorded.

Confusion task. Following the encoding phase, participants completed a filler task designed to muddle memory for the encoding task behaviors (see Carlston & Skowronski, 1994). Participants were presented with 30 sentence pairs, each supposedly describing a different person. After reading each pair, participants indicated which person in the pair they would like better.

Paired-associates task. Following completion of the confusion task, participants viewed each of the 48 previously seen photos. These appeared in mid-screen (to remove context memory for screen location in the encoding phase). Appearing below each photo was a single trait word. Each photo-trait pairing was on screen for 6 s. Participants were instructed to memorize the word paired with each photo. Half of the trials represented *relearning* trials: The trait that was paired with the photographed individual matched the trait implied by the behavior with which that individual was paired earlier. The remaining trials were *new-learning* trials: The trait was unrelated to the neutral behavior with which that individual was paired earlier. The two individuals who appeared on the same trial of the encoding task were both paired with the same trait in the paired-associates task. One constraint on presentation order was that these trials did not occur consecutively.

Trait recall task. After completion of the paired-associates task, participants completed a 5 min filler task in which they solved anagrams. This provided a delay between the association and recall tasks. Afterward, participants viewed each of the 48 photos from the paired-associates task. These were presented in a random order. Participants typed into the computer their recollection of the word paired with the photo. On completion of this task, participants were debriefed, thanked, and dismissed.

Results and discussion

Trait recall

A coder blind to condition used a gist criterion to classify as correct or incorrect the trait recalled on each trial. The proportion of traits correctly recalled by each participant was separately calculated for each cell in the design matrix. These proportions were entered into a 2 (Speaker: speaker vs. non-speaker) × 2 (Referent: self vs. other) × 2 (Behavior: trait-implicative vs. neutral) within-subjects ANOVA.

A savings effect was indicated by the significant behavior main effect, $F(1,49) = 18.02$, $p = .001$. Participants better recalled traits ($M = .45$) when the initial behavior had

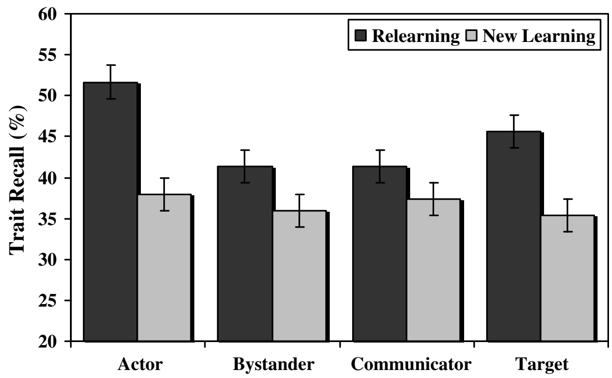

Fig. 1. Trait recall as a function of stimulus type (i.e., Speaker × Referent combination) and trial type, Study 1.

matching trait implications than when the initial behavior was neutral ($M = .37$). However, interpretations of both this effect and the significant Referent × Speaker interaction, $F(1,49) = 4.64$, $p < .05$, are qualified by a Referent × Behavior × Speaker interaction, $F(1,49) = 3.59$, $p = .06$.

Follow-up analyses examined the behavior main effect within each combination of referent and speaker (to correspond with the four stimulus types in the experiment). These analyses showed that the behavior effect was significant for *Actors*, $F(1,49) = 15.06$, $p < .001$, and *Targets*, $F(1,49) = 5.61$, $p < .05$, but not for *Bystanders*, $F(1,49) = 2.54$, $p = .118$, or *Informants*, $F(1,49) = 1.12$, $p = .29$ (for means, see Fig. 1).

Probe response latencies

Mean latencies to the arrow probe were calculated for each participant within each cell of the 2 (Speaker: speaker vs. non-speaker) × 2 (Referent: self vs. other) × 2 (Behavior: trait-implying vs. neutral) design and submitted to a repeated-measures ANOVA.[1]

Only three effects emerged; (largest non-significant $F = 1.22$, $p = .275$). The first was a referent main effect, $F(1,48) = 10.08$, $p < .01$. Probe responses were faster for other-informants ($M = 680.27$ ms) than for self-informants ($M = 737.22$ ms). The second was a behavior main effect that approached significance, $F(1,48) = 3.58$, $p = .064$. Probe responses were faster when the behavior was trait-neutral ($M = 694.86$ ms) than when it implied a trait ($M = 722.63$ ms).

However, interpretation of these effects is qualified by a Referent × Trait interaction, $F(1,48) = 4.27$, $p < .05$. Follow-up analyses indicate that for self-informants, participants responded more quickly to the probe when the behavior was trait-neutral ($M = 704.82$ ms) than when the behavior implied a trait ($M = 769.63$ ms), $F(1,48) = 7.69$, $p < .01$. This effect did not occur for other-informants, $F < 1.0$, *ns* ($M_{\mathrm{TRAIT}} = 675.64$ ms vs. $M_{\mathrm{NEUTRAL}} = 684.91$ ms).

Summary

The recall measure replicated findings reported by Crawford et al. (2007a). Savings effects in trait recall were observed for *Actors* (self-informants) and *Targets* (e.g., the target of an other-informant's description). The presence of *Target* photos at behavior presentation seemed to minimize savings that otherwise occur for *Informants* (e.g., no STT effect emerged). Finally, no savings effects were observed for *Bystanders*.

An attention-and-association based explanation for these findings would suggest that these data were caused by differential patterns of attention to photos during behavior encoding. The probe data do not support such an explanation. If visual attention was crucial to such effects, then one should find faster probe responses when the probe was in the location of an *Actor* than in the position of the *Bystander*, and when in the location of a *Target* than in the location of an *Informant*. These effects did not occur. Hence, these data are more consistent with Todorov and Uleman's (2004) idea that the savings to *Actors* and *Targets* reflects deeper attributional processing about those individuals and that such processing interferes with, or otherwise prevents, the formation of associations to *Informants* and *Bystanders*.

Another element of the attention data can be construed as supporting the idea that participants made inferences about *Targets* and *Actors*. Participants were especially slow to respond to the probe after reading a trait-implying sentence. Although speculation, one might argue that the attributional processing that is occurring in response to trait-implying behavior consumes cognitive resources, interfering with performance of the probe task.

Study 2: Eye tracking and trait ratings

However, despite its apparent support for the Todorov and Uleman (2004) attributional mechanism, one might argue that the cueing data do not eliminate the visual attention explanation. Because the probe was always presented at the end of a trial, the probe measure may not reflect how much time was actually spent on each individual photo *during the trial*. To address this issue, the second study assessed attention in an on-line fashion. Eye-tracking technology was used to continuously measure eye location and movement during encoding of each behavior. Measures obtained reflected the number of times a photo was looked at (i.e., eye movements, or saccades which serve as a direct measure of visual attention; Fischer & Breitmeyer, 1987; Remington, 1980), as well as the total time spent looking at each.

These measures were examined in the context of trait rating data obtained about *Actors*, *Bystanders*, *Informants*, and *Targets*. It was expected that on critical traits implied

[1] Overall correctness was 97.45%. Incorrect responses were excluded from analysis. In addition, latencies over 2 *SD* above the mean were excluded (less than 1% of total latencies).

by behaviors, more extreme ratings would be given to *Targets* than *Informants*, and to *Actors* than *Bystanders*. The latter result would again show that the STT effect can be eliminated by presentation of the *Target* photo along with the behavior description, and the former result would show that the elimination of this effect is not a mere consequence of the presentation of a second photo. The use of the eye-tracking data can reveal the extent to which these effects may (or may not) be related to visual attention to photos.

Method

Participants

Thirty-five individuals attending the University of Bristol participated. Compensation was either course credit or for the sum of £7 (approximately $13). The eye-tracking data file for one participant was corrupted, so data from only 34 participants are included in those analyses.

Procedure

The procedure duplicated that of Study 1 with the following exceptions. A new set of 48 photos was used to better control visual information in the photographs. Photos were 235×300 pixels, full color, and depicted students from Stirling University. Each individual was photographed in front of a grey background. Because low level perceptual characteristics (e.g., contrast and luminance) of the images can attract visual attention, all images were fed through imaging filters to equate both the contrast levels and the overall luminance of the images. Thus, any eye movements to one of the images cannot be attributed to differences in the visual properties of the images. Each behavior description was incorporated into a single 1023×768 bitmap image. These images were presented in random order during the encoding phase.

Eye tracking. Participants' two-dimensional eye movements during the encoding phase were measured using Eyelink II (SR Research Ltd.). Each experimental session began with a nine-point grid calibration and validation. Between trials a fixation circle reappeared to correct for head-movement drift. Eye movements were recorded at a sampling rate of 500 Hz and a spatial resolution typically less than 0.3° of visual angle.

Exposure task. Participants were first fitted with the eye-tracking apparatus. Once the headgear was attached and calibrated, the experimenter read the instructions out loud. The experimenter explained that the participant would be seeing two individuals and a behavior on each screen and that they were to familiarize themselves with the types of images and information that was being presented (the same *familiarization* instructions used in Study 1).

Participants were told to look at the fixation point (a small cross that appeared in the center of the screen) at the start of each trial. Once a stable fixation occurred, the stimuli for that trial, activated by the experimenter, appeared on-screen. Each of the 24 trials appeared for 12 s. The order in which they appeared was random. Once all trials were completed, the eye-tracking apparatus was removed and participants engaged the remainder of the experiment.

Trait ratings task. Participants completed the confusion task as in Study 1 and then completed a trait ratings task. Participants were told they would be shown images of the individuals from the first half of the experiment and should rate each individual on the traits presented using a nine-point scale. A higher numerical response indicated that the individual possessed more of the trait.

Participants were then shown, one at a time, all 48 photographs from the exposure task. Each photograph was rated three times—once on a *critical* trait (i.e., the trait implied by the behavior description with which a photo was paired), once on a trait *evaluatively congruent* with (but low in semantic relatedness to) the critical trait, and once on a trait *evaluatively incongruent* with (but low in semantic relatedness to) the critical trait. Note that for photos that were paired with neutral behaviors, traits were arbitrarily designated as critical, evaluatively congruent, and evaluatively incongruent via matching to the same trait set used on the trait-implicative trials.

A counterbalancing scheme ensured that each trait was used twice in each trait role (critical, congruent, incongruent). Thus any results emerging from analyses cannot be attributed to any particular behavior, trait, photograph, or combination of stimuli. Once participants had completed all ratings, they were debriefed, paid (or credited), and dismissed.

Results and discussion

Implied traits

Mean trait ratings on traits implied by trait-implicative behaviors were calculated for each participant across photos within each cell of the design matrix. Note that in trait-implicative conditions, these trait ratings could reflect the trait implications of behaviors with which photos were paired. Photos in neutral conditions were rated on these same traits, and hence, serve as control targets. These means were submitted to a 2 (Referent: self vs. other) × 2 (Behavior: trait-implying vs. neutral) × 2 (Speaker: speaker vs. other) within-subjects ANOVA.

The analysis yielded a behavior main effect, $F(1,34) = 18.13$, $p < .001$. Higher trait ratings emerged when a target was paired with a trait-implicative behavior ($M = 5.42$) than with a neutral behavior ($M = 4.95$). However, interpretation of this effect, as well as the main effect of speaker, $F(1,34) = 10.02$, $p < .01$, and the Referent × Speaker interaction, $F(1,34) = 12.15$, $p < .01$, are qualified by a Referent × Behavior × Speaker interaction, $F(1,34) = 20.376$, $p < .001$.

Follow-up analyses examining the Behavior effect within each Referent × Speaker combination (see Table 1 for means) showed that trait ratings were elevated for *Actors* and *Targets* (both $p < .001$), but not for *Bystanders* or *Informants* (both $F < 1.0$). Thus, traits were ascribed only

Table 1
Mean trait ratings, Study 2

	Behavior type	
	Trait-implying	Neutral
Actor		
Implied	5.69_a (.85)	4.82_b (.96)
Congruent	4.62_a (.50)	4.23_b (.40)
Bystander		
Implied	5.22_a (.77)	5.20_a (.95)
Congruent	4.58_a (.57)	4.65_a (.42)
Informant		
Implied	4.87_a (.85)	4.77_a (.68)
Congruent	4.23_a (.52)	4.43_a (.37)
Target		
Implied	5.88_a (.74)	5.02_b (.94)
Congruent	5.01_a (.62)	4.53_b (.58)

Note: Standard deviations in parentheses; subscripts that differ by row significant in two-tailed tests ($p < .05$).

to those who had performed behaviors. There was no evidence of ratings elevation for non-performers, even when the non-performer was the *Informant*. The latter null effect confirms the finding of Crawford et al. (2007a) that presenting a photo of the *Target* along with the behavior eliminates the trait association that would otherwise be made to the *Informant.*

Evaluative generalization

Carlston and Skowronski (2005) suggest that associative effects (as in STT) on trait ratings should be restricted to traits implied by behaviors. In comparison, attributional processing effects (as in STI) should be reflected in evaluative generalization across trait ratings. Accordingly, the Todorov and Uleman (2004) attribution-based account for the critical trait ratings made about *Actors* and *Targets* implies such generalization effects. In comparison, an attentional account of both STT and STI effects would not be consistent with such generalization effects.

To examine evaluative generalization within the ratings data, the evaluatively incongruent trait ratings were reverse-scored. An index of evaluative congruity was then calculated for each participant by averaging the congruent and incongruent trait ratings within each cell of the design matrix. These averages were submitted to a 2 (Speaker: yes vs. no) × 2 (Referent: self vs. other) × 2 (Behavior: trait vs. neutral) repeated-measures ANOVA (means presented in Table 1).

The main effects for speaker, $F(1,34) = 27.70$, $p < .001$, and behavior, $F(1,34) = 6.72$, $p < .05$, as well as a Speaker × Referent interaction, $F(1,34) = 4.92$, $p < .05$, were all qualified by a Speaker × Referent × Behavior interaction, $F(1,34) = 20.27$, $p < .001$.

Analyses examining the behavior effect within each Speaker × Referent combination revealed significant effects for both *Actors*, $F(1,34) = 13.36$, $p < .01$, and *Targets*, $F(1,34) = 9.98$, $p < .01$. As shown in Table 1, trait ratings for these two targets yielded evidence of evaluative generalization.

While an effect that approached significance emerged for *Informants,* $F(1,34) = 2.88$, $p = .099$, the means for this effect are opposite of the direction suggestive of evaluative generalization. The *Bystander* effect was not significant ($F < 1.0$). Hence, there is no evidence of evaluative generalization for *Informants* and *Bystanders*.

Eye-tracking data

For each participant, data were analyzed only from the eye that had the best spatial movement measurement accuracy. Trials were rejected if the initial fixation location at a trial's start was not within 0.5° of the center of the fixation point.

Number of saccades. One measure calculated for Study 2 involved saccades. A saccade represents either a voluntary or involuntary eye movement which is primarily concerned with fixation within an image. The end point of a saccade, thus, shows where exactly the perceiver is looking within an image and provides an on-line and direct measure of visual attention. A saccade onset was defined as a change in eye position with a minimum velocity of 30°/s, or minimal acceleration threshold of $8000°/s^2$. Saccades to each photo were counted. For each participant, means reflecting the numbers of saccades during encoding[2] across photos were separately tabulated within each cell of the design matrix. These were submitted to a 2 (Speaker: yes vs. no) × 2 (Referent: self vs. other) × 2 (Behavior: trait vs. neutral) repeated-measures ANOVA.

The analysis yielded a main effect for speaker, $F(1,33) = 11.41$, $p < .01$. More saccades were made to speakers ($M = 5.49$) than non-speakers ($M = 4.41$). The analysis also revealed Speaker × Referent, $F(1,33) = 13.05$, $p < .01$, and Speaker × Behavior, $F(1,33) = 8.66$, $p < .01$, interactions. However, the Speaker × Referent × Behavior interaction that was present in the ratings data did not emerge here (report $F < 1.0$, *ns*). Hence, by the logic of mediational analyses, the attentional data cannot mediate the trait ratings data.

To emphasize this point, the saccade data were examined within each combination of Behavior and Referent (means shown in Table 2). These analyses revealed that in self-informant conditions people attended more to *Actors* than *Bystanders*, regardless of whether behaviors implied traits, $F(1,33) = 28.40$, $p < .001$, or not, $F(1,33) = 22.49$, $p < .001$. However, in other-informant conditions, participants made an equal number of saccades to *Informants* and *Targets*, regardless of whether behaviors implied traits (both Fs < 1.0, *ns*).

Fixation duration. Data were considered indicative of a fixation when the eye movement velocity fell below the sac-

[2] Only saccades to the left or right third of the screen where the photographs were located were included in this analysis as saccades in the middle third of the screen involve reading the behavioral statements and are of no interest to the current investigation.

Table 2
Mean saccade frequencies and fixation durations, Study 2

	Behavior type			
	Trait-implying		Neutral	
	Speaker	Non-speaker	Speaker	Non-speaker
Self-informant				
# Saccades	6.17 (2.84)	3.68 (1.56)	5.78 (2.52)	4.17 (1.49)
Fixation duration (ms)	1918	977	1674	1128
Other-informant				
# Saccades	4.70 (2.34)	4.82 (2.61)	5.30 (2.36)	4.97 (2.62)
Fixation duration (ms)	1371	1327	1599	1418

Note: For self-informant trials, Speaker = *actor*, Non-Speaker = *bystander*; for other-informant trials, Speaker = *informant*, Non-Speaker = *target*.

cade onset value for five successive samples. Fixation duration to each photo was tabulated. For each participant, means reflecting the amount of time spent on each photo during encoding were separately tabulated across photos within each cell of the design matrix. These means were submitted to the same 3-factor within-subjects ANOVA applied to the saccade data.

The analysis revealed a speaker effect, $F(1,33) = 12.37$, $p < .001$. Participants spent more time looking at speakers ($M = 1584.34$ ms) than at non-speakers ($M = 1268.67$ ms). The analysis also yielded Speaker × Referent, $F(1,33) = 14.45$, $p < .001$, Speaker × Behavior, $F(1,33) = 15.09$, $p < .001$, and Referent × Behavior, $F(1,33) = 7.54$, $p = .01$, interactions. However, the Speaker × Referent × Behavior interaction that was present in the ratings data did not emerge here (report $F(1,33) = 2.65$, $p = .113$). Hence, by the logic of mediational analyses, the attentional data cannot mediate the trait ratings data.

To emphasize this point, the fixation data were examined within each combination of Behavior and Referent. In self-informant conditions participants spent more time looking at *Actors* than *Bystanders*, regardless of whether the behaviors were trait-implicative, $F(1,33) = 74.64$, $p < .001$, or not, $F(1,33) = 15.29$, $p < .001$. However, in other-informant conditions, participants spent equal time looking at *Informants* and *Targets*, regardless of whether behaviors implied traits (both Fs < 1.0, *ns*).

Summary

The trait ratings data obtained in Study 2 corresponded nicely to the savings data from Study 1. In Study 2, both *Actors* and *Targets* were rated especially high on the trait implied by a behavior (compared to when they were paired with trait-neutral behaviors). This heightened rating did not occur for either *Informants* or *Bystanders*. This non-effect for *Informants* again shows that presentation of *Target* photos reduces or eliminates STT effects.

The on-line visual attention measures reflect patterns that differ from the trait measures. Participants in self-informant conditions made more saccades to *Actors* than *Bystanders* and spent significantly more time (more than twice as long) looking at the former versus the latter. In other-informant conditions participants made the same number of saccades to *Informants* and *Targets* and spent the same amount of time looking at each. These patterns occurred regardless of whether the behavior paired with the photos was trait-implicative or neutral. The differences in patterns of data obtained for the trait ratings, and for the attentional measures, suggest that the trait ratings data cannot be explained by the effect of the independent variables on visual attention to the various photos. Instead, the data suggest that perceivers were engaging in attributional thinking about those who performed behaviors (*Actor*s and *Targets*). That evaluative generalization occurred to both *Actors* and *Targets* provides additional support for the idea that attributional processing occurred for those targets.

Coda

The data described in this article show that the presentation of a target photo while an informant describes the target's behavior reduces or eliminates the tendency to associate the informant with the trait implied by the behavior. This occurs, we argue, because the photo instigates attributional activity about the target. Ironically, then, this dual-photo condition reflects yet another case of STI. That is, people seem to engage in the same kinds of inference-making, and produce the same kinds of data, to people described by both their photo and a behavior, regardless of whether the behavior is a self-description or is a description provided by an informant. Hence, the data continue to document the ubiquity of STI (Uleman et al., 2005).

Exactly why attributional activity prompted by target photos eliminates the STT effect is yet to be determined. Perhaps the STT effect is not entirely passive. Instead, some minimal level of cognitive activity may be required for STT effects to occur. However, manipulations of cognitive load and processing goals have generally not altered the strength of STT effects (Carlston & Skowronski, 2005; Crawford et al., 2007b). Thus, why the "minimal activity level" idea may be specific to the dual-photo condition is undetermined.

Although the data unequivocally indicate that visual attention is not the driving force in limiting STT, it should be noted that these measures control for what perceivers look at, but do not necessarily reflect the contents of working memory. Perhaps perceivers are mentally fixating on the actor, even as their eyes wander around the stimulus image. That is, it is possible that the actor representations spend more time being encoded and elaborated upon than non-actor representations because of the expectation that a particular behavior is diagnostic for the former, but not the latter. Alternatively, it may be that perceivers are so used to processing actors as causal agents that actor representations are automatically kept active in memory longer than (seemingly irrelevant) non-actors. From an associational perspective, this increased amount of time in memory should translate directly into probability of being associated with the trait used to encode the behavior.

Clearly, then, additional work needs to be done to explicate the mental mechanisms underlying STT effects, and the disappearance of those effects. However, it is now clear that STT effects can be limited. Certainly, the data now convincingly suggest limitations to attempts to strategically use the STT effect to one's advantage. To do so by describing the positive behaviors of others, one needs to offer those descriptions when the individual who performed those behaviors is absent. Otherwise, at least from an STT-based image manipulation standpoint, one will simply be wasting one's words.

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