WHEN YOU SEE OTHERS TALK ABOUT A PERSON YOU LIKE OR DISLIKE ON SOCIAL MEDIA: TESTING SPONTANEOUS TRAIT TRANSFERENCE AND COGNITIVE BALANCE

By

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ABSTRACT

WHEN YOU SEE OTHERS TALK ABOUT A PERSON
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We often encounter people talking about other people on social media. However, research on how people process such messages to form an impression toward the message writer on social media has been rare. This study investigated how a message recipient's existing attitude toward a person (i.e., target) who is being described by another person (i.e., source) on social media affects the evaluation about the source from the perspective of spontaneous trait transference (Skowronski, Carlston, Mae, & Crawford, 1998). Research has shown that people tend to mistakenly associate a target's trait with a source, although if the false association still exists when message recipients hold pre-existing attitudes toward targets has not been answered yet. To investigate the issue, the current study proposed two competing hypotheses. The first hypothesis predicted that more extreme pre-existing target attitudes would increase the salience of the target and thus would reduce the false association between the target and a source. The second hypothesis, drawing upon cognitive balance (Heider, 1958), predicted that people would evaluate a source in a manner in which they can maintain the cognitive consistency between their pre-existing target attitudes and newly formed source attitudes. Results from a 3 (initial attitude toward a target: positive vs. neutral vs. negative) x 3 (source's description about a target: positive trait vs. negative traits vs. no trait) web-based experiment using the Twitter interface supported the prediction based on cognitive balance. The current study presents an important theoretical boundary condition for spontaneous trait transference on social media.

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INTRODUCTION

Much of our everyday conversation is filled with talk about other people (Dunbar, 1998). Messages on social media such as Facebook and Twitter often describe other people's actions and what the message writers think of those actions (Baron, 2008). For instance, it is easy to come across people on social media describing what they have seen or heard about a celebrity's actions or about their friends. Describing someone else's behavior certainly has a purpose of its own. It may reflect the motivation of showing others whether the writer approves or disapproves of the behavior. It may also simply reflect that the writer thinks it is worth sharing because it is informative or fun.

No matter what the purpose behind the message is, an important but often unnoticed effect of writing such a source's message is the readers' perceptions of the message *writer* (i.e., source). Research suggests that a simple description of a target's action can recursively affect readers' impressions of the source (Skowronski, Carlston, Mae, & Crawford, 1998). Specifically, people have been found to attach the trait implied from a behavioral description of a target to a source, a phenomenon referred to as *spontaneous trait transference* (STT; Skowronski et al., 1998). For instance, if Person A describes Person B's intelligent behavior, people who read the message will not only evaluate Person B as being intelligent, but also Person A as being intelligent. This cognitive mistake occurs due to people's automatic tendency to infer a trait from a behavior and an urge to connect the inferred trait to the most salient person at the moment, which is likely to be the source, the communicator (Crawford, Skowronski, & Stiff, 2007). Of course, when the real target becomes salient at the moment of receiving the message, the effect is weakened or disappears (Crawford et al., 2007; Crawford, Skowronski, Stiff, & Leonards, 2008; Goren & Todorov, 2009).

Previous studies have employed a few different ways to increase the salience of the target to eliminate STT such as showing the target's photo accompanying the source's description of the target (Crawford et al., 2007; Crawford et al., 2008). However, these methods may be somewhat artificial given that a large part of talking about others' behaviors happens when the targets are absent, as the literature on gossiping suggests (Dunbar, 1998, 2004). In addition, empirical studies on STT have always employed targets unknown to message recipients, although the theory itself does not have such a constraint on target characteristics. By using only unknown targets, previous STT research has overlooked common communication contexts where each party already holds certain attitudes toward the target being described, which constrains the generalizability of the STT findings. This study thus aims to address those problems simultaneously by investigating the role of message recipients' existing attitudes toward the target on source evaluations. More specifically, the current study hypothesizes that holding strongly valenced attitudes, either positive or negative, enhances the salience of the target in recipients' minds and thus reduces the association between the target's trait and a source.

The body of literature on cognitive balance, however, presents a different prediction regarding the impact of message receivers' existing attitudes about a target on their attitudes about a source. Heider's balance theory (1958) argues that people like to achieve a balance between attitudes toward a source and a target. In other words, people are likely to evaluate a source whose attitudes about a target are congruent with their own attitudes more positively than a source whose attitudes about a target are incongruent with their own. Whereas the previous hypothesis based on the STT literature focuses on the role of the presence of recipients' pre-existing attitudes toward a target regardless of their attitude valence, balance theory emphasizes

the role of their attitude valence. Based on balance theory, this study hypothesizes that message recipients evaluate a source whose attitude toward a target is similar to their own attitude toward the target more positively than a source whose attitude toward the target is different with their own attitudes toward the target. The newly formed attitude about a source will be reflected in the association between the source and trait ratings.

To test these competing hypotheses, this study performed a web-based experiment using the context of social media, which is currently an easy and common venue for impression formation of people (e.g., Antheunis, Valkenburg, & Peter, 2010; Carr & Walther, 2014; Levordashka & Utz, 2017; Walther, Van Der Heide, Kim, Westerman, & Tong, 2008). This study first gave information about targets to participants such that participants would form a favorable, unfavorable, or neutral impression of the targets. Participants then read social media postings where an unknown neutral source described one of the targets' trait-implying behaviors and evaluated the extent to which the source seemed to possess the trait of the target.

Below, the current study first introduces the origin of STT and important findings related to the impact of target's salience on STT. It then discusses how existing attitudes toward a target may enhance the target's salience, which leads to the first hypothesis (*H1*). The paper then introduces cognitive balance and discuss how it leads to a competing prediction regarding the impact of existing attitudes on source-trait association (*H2*). A web-based experiment which manipulated participants' attitudes toward targets tested which hypothesis corresponds more strongly with the data on a social media platform.

LITERATURE REVIEW

Spontaneous Trait Transference and Target's Salience

Previous literature on people's impression formation has found that people automatically infer traits from observing or hearing about a person's behavior regardless of their motivation to infer traits (Carlston & Skowronski, 1994). This tendency is referred to as spontaneous trait inference (STI; Newman & Uleman, 1989; Winter & Uleman, 1984). Evidence suggests that people infer traits from a person's behavior even when they read the message describing the behavior for a very short time or when there was a second task that divided their attention (Todorov & Uleman, 2003). In addition, people who did not recognize the behavioral description still associated the trait implied in the message with the actor of the behavior (Carlston & Skowronski, 1994). These findings give strong support to the notion that it is human nature to try to understand what kind of a person one is.

Spontaneous trait transference originated from an investigation to test spontaneous trait inference. Carlston, Skowronski, and Sparks (1995) encountered the unexpected result that their participants associated the implied trait from a behavioral description about a target not only with the correct target but also with the source who described the target's behavior. For instance, when a person described another person's honest behavior, people associated the source as well as the target with honesty. This interesting though unreasonable judgment called for a more systematic investigation to replicate and to understand the mechanism. Later, Skowronski et al. (1998) conducted a series of experiments that succeeded at replicating the finding. They termed the phenomenon as spontaneous trait transference as people seem to infer *traits spontaneously* and (mistakenly) *transfer* the traits to the source.

They also suggested a three-step mechanism of how STT emerges. The first step is *trait activation* where a message recipient infers a trait from a behavioral description. Previous research on STI supports the notion that this step occurs as long as behavioral descriptions clearly imply particular traits (e.g., Carlston & Skowronski, 1994). The second step is *trait association* where the inferred trait is connected to other targets that share the same environment. In this step, if the actual actor of the behavior is not salient, the most salient person at the moment which is likely the source describing the actor becomes associated with the implied trait (Crawford et al., 2007). A recent study (Shin & Walther, 2016) that investigated how source salience affects STT demonstrated that regardless of how the source presents him or herself (picture, avatar, name) with the behavioral description of a target, STT occurred. This finding suggests that STT does not require a high level of source salience as long as the source is more salient than the target. Lastly, the third step is *trait influence* where people use the source-trait association established in the second step to judge the source when asked to evaluate the source. Previous research either measured people's implicit association between the source and the target's trait using the savings in a relearning paradigm (see for the paradigm Carlston & Skowronski, 1994) or explicit trait rating of the source (e.g., Carlston & Skowronski, 2005). Both methods confirmed the existence of STT.

Of the three steps, the key to creating STT lies in the second step, which describes the associative nature of the phenomenon. The STT phenomenon, in other words, occurs simply because both the source and the target's trait are activated together in working memory and thus easily connected to each other (Olson, Fazio, & Han, 2009). This explanation is in contrast to alternative logical explanations such as (a) assuming that the source shares similar traits with the source's acquaintance (i.e., target), (b) forgetting that the source was describing someone else's

behavior and not his or her own behavior, or (c) believing that the source projects his or her own traits onto targets (Mae, McMorris, & Hendry, 2004). Empirical results support the original associative explanation rather than alternative logical explanations. For example, in Skowronski et al.'s (1998) seminal study, researchers told participants that the messages they were going to read were fabricated, not originating from the sources. Still, participants associated the target's traits implied in the messages with the sources. Carlston and Skowronski (2005) even pre-warned participants to avoid misattribution of a target's trait to sources. The results showed that, nevertheless, STT occurred. These findings negate the alternative explanations for STT, supporting the original explanation of simple mental associations between two co-activated, salient concepts appearing in the same environment.

Research has shown that one effective way to reduce STT is to make the target more salient. This will prevent the false association between the target's trait with the source by focusing people's attention to the right target (Crawford et al., 2007) and promoting the inferential process about the target (Crawford et al., 2008; Todorov & Uleman, 2004). Several studies tested this prediction using different methods. First, Crawford et al. (2007) showed their participants a trait-implying behavioral description with photos of two different individuals (source photo and target photo). This was in contrast to the typical STT study (e.g., Skowronski et al., 1998) where participants only see a behavioral description with a source photo. Results revealed that people associated the inferred trait with the target, but not the source. Second, Crawford et al. (2008) used the same two-picture method as Crawford et al. (2007) with a modification to investigate the exact mechanism behind the salient target effect. In Study 1, they measured the visual attention by recording how fast people responded to arrows appearing on a computer screen immediately after the messages and photos. The arrows were either in the

position of target or in the position of source. The researchers assumed that people would respond to the arrow faster when it took the place of the target rather than the source if people indeed focus more heavily on the target photo. Results, however, did not show such a difference. In Study 2, they used eye-tracking technology to measure how many times the target photo was looked at and how much time people spent on it. Results again showed no significant difference between attention given to the target photo and the source photo. In both studies, no evidence of STT was found. Crawford et al. (2008) concluded that STT disappears when a target photo is present not because people pay more attention to the target than the source but because the presence itself enables viewers to start a deeper attributional process to understand the target, which interferes with the false associative process between the target's trait and the source. Third, Goren and Todorov (2009) took a similar approach to Crawford et al.'s (2008) study by showing participants two faces (each serving two roles: a source and a target) and two sentences (each describing one face and written from another face) simultaneously. Results showed STT disappeared, replicating previous studies using target photos. Lastly, Carlston and Skowronski (2005) used a different method to enhance the target's salience. Just prior to the trait rating of each source, participants were forced to recall whether the nature of the behavioral description was self-descriptive or other-descriptive. After circling either "self" or "other," they rated each source's trait. Results showed that STT was again eliminated, although the overall recognition was poor. This result suggests that reminding people of the presence of a target in the trait influence step helps reduce STT.

Although these studies uniformly suggest that increasing the target's salience helps reduce this bias in impression formation, the particular methods they employed to test their hypothesis may constrain the applicability of the finding to natural settings. To begin with,

unlike experiment settings where participants can see targets' photos or videos accompanying behavioral descriptions about the targets, in natural communication settings, people often only receive verbal messages from a communicator. This is especially true when people want to describe a target's negative behaviors. Showing a target next to a source is not always possible or socially appropriate when the source wants to discuss the target in a rather clandestine manner. This concern raises a need to find alternative ways to enhance the target's salience without relying on the target's visual representations. Carlston and Skowronski (2005) showed one such way to increase the target's salience by asking participants just prior to evaluating a source whether the message they previously read depicted the source or the target. While this method successfully reduced STT, the mechanism underlying its success seems to be the receiver's post-hoc correction rather than a natural processing and storing of information that occurs at the moment of receiving a message. Thus, there still remains a need for alternative methods to enhance the target's salience in a naturalistic way.

In addition, STT literature has overlooked communication contexts where message recipients already have certain attitudes toward the target. In most studies, targets were random college students unknown to the participants. However, in reality, people often talk about common acquaintances or targets about which both parties hold certain attitudes. Although there was one study that demonstrated STT occurs regardless of existing attitudes toward a source by using celebrities as sources (Mae, Carlston, & Skowronski, 1999), no study has yet investigated how existing attitudes toward a target would affect matters in the context of STT. This gap in the literature leaves us with only a partial picture of the role of existing attitudes in STT.

The current study posits that existing attitudes toward a target serve as cues to enhance the target's salience. Attitudes are defined as "associations in memory between an attitude object

and one's evaluation of the object" (Fazio, 1995, p. 247). Research has shown that people can automatically activate their existing attitudes when they see an attitude object, the likelihood of which is determined by the strength of the object-evaluation association (Fazio, Sanbonmatsu, Powell, & Kardes, 1986). The stronger the object-evaluation association, the easier one can activate the association (Fazio, 1993; Fazio et al., 1986). The ease or likelihood of activating an object-evaluation association from memory when encountering the attitude object is called attitude accessibility (Fazio, 1995). Previous literature has found that the more accessible existing attitudes are, the more influential they are in affecting people's information processing and decision making (Fazio, 1995; Fazio, Blascovich, & Driscoll, 1992; Fazio, Powell, & Williams, 1989).

Attitude extremity, which is often measured by the deviance from the neutral point on attitude scales, has a positive correlation with attitude accessibility empirically (Fazio & Williams, 1986; Krosnick, Boninger, Chuang, Berent, & Carnot, 1993; Powell & Fazio, 1984). It is thus likely that the moment people receive a message regarding someone about whom they hold extreme attitudes, they start to think about that target more than they would when receiving a message regarding someone about whom they hold neutral attitudes. In other words, existing attitudes about the target may affect the target's salience in recipients' minds. The increased reflection on a target is likely to promote the attributional process about the target, which was suggested to prevent or overwhelm the associative process between the source and the inferred trait (Crawford et al., 2008). The current study thus posits that the more extreme receivers' existing attitudes toward the target, the more salient the target becomes, and subsequently the less likely STT is to occur.

What is not very clear, however, is the effect of the attitude valence – whether receivers initially hold positive or negative attitudes toward the target – on the target salience. One might ask if a negativity effect (Anderson, 1965; Hamilton & Huffman, 1971; Hamilton & Zanna, 1972) – the phenomenon where negative information is more heavily weighted in forming an impression – would appear. If so, negative existing attitudes are more likely to increase the target's salience than positive existing attitudes. A negativity effect, however, is more about paying attention to (Fiske, 1980) or giving more weight to (Kanouse & Hanson, 1987; Kellermann, 1984) negative information when forming an impression about a target, not about the degree of salience the target entity itself takes in people's minds. In addition, there has been no systematic investigation of the impact of existing attitude valence on the attitude accessibility or target's salience. Considering this lack of evidence, the most logical conjecture that can be made at this point is to say there will be no difference between positive and negative initial attitudes in affecting target's salience. As long as people hold strongly directed target attitudes, either positive or negative, they are predicted to think about the target immediately upon receiving a message pertaining to it, which may consequently reduce STT (see Figure 1 for a visual depiction). The following hypothesis reflects this prediction.

H1. The more extreme message recipients' existing attitudes toward a target, the less likely they are to associate the target's trait with a source.

Cognitive Balance

Although there was no cogent argument to assume a difference between positive initial attitudes and negative initial attitudes on target's salience, theories based on cognitive consistency such as Heider's balance theory (1946, 1958) enable us to predict the role of the direction of initial attitudes toward targets. The theory holds that people have a strong motivation

to maintain the balance between attitudes toward different objects that are connected to one another. The balance is defined as "a harmonious state in which the entities comprising the situation and the feelings about them fit together without stress" (Heider, 1958, p. 180). For instance, a balance is achieved when friends agree with each other, and enemies disagree with each other. When certain events disrupt the balance, people feel discomfort and an urge to restore the balance by changing their attitudes.

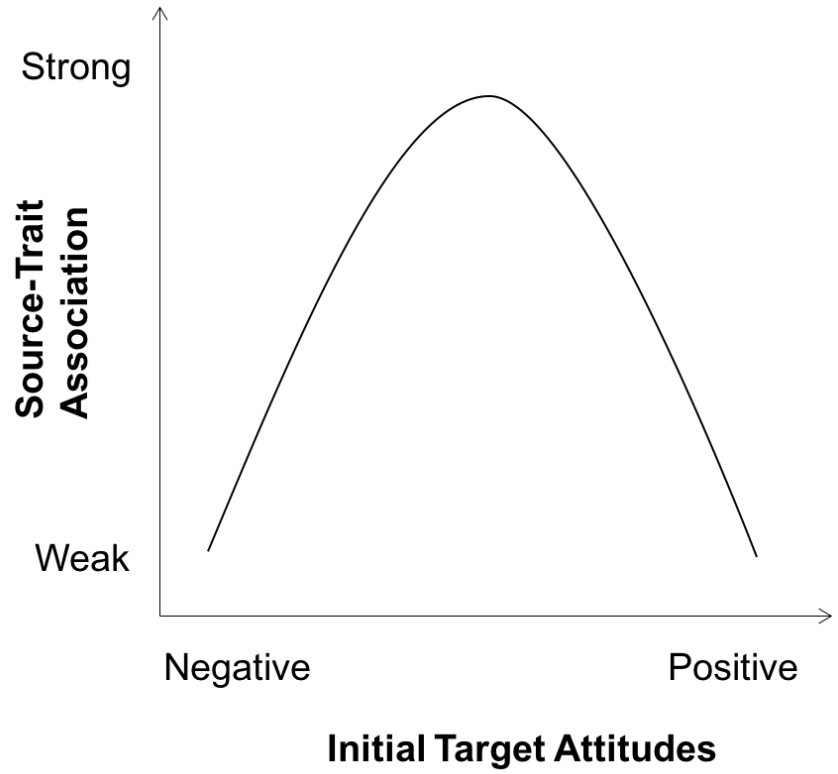

Figure 1. A visual depiction of H1.

Heider (1946, 1958) illustrates this balance principle with using a P-O-X triad. In the relationship among three entities (P, O, X), a balance is achieved when three possible relationships (P-O, O-X, P-X) are all positive or two relationships are negative and one relationship is positive. Let's suppose a message recipient as P, a source who wrote a social media posting as X, and a target described by a source in the social media posting as O. If a message recipient likes a target (P + O), and reads a source's message that describes a positive

trait of the target (e.g., “O is always on time.”; X + O), then the message recipient is likely to like the source (P + X), if the balance principle is correct. This is all-positive relationships which is cognitively balanced. On the other hand, if a message recipient likes a target (P + O), and reads a source’s message that describes a negative trait of the target (e.g., “X is always late to work.”; X - O), then the message recipient is likely to dislike the source (P - X), to maintain the cognitive balance. This triad has two negative links and one positive link, which is another example of balanced triad.

Previous research provides multiple empirical evidence to support the balance principle. As one example, Aronson and Cope (1968) demonstrated that people liked those who punished whom they disliked through an interesting experiment in a naturalistic setting. The researchers manipulated their participants’ initial liking (vs. disliking) toward a target by making the target act nicely (vs. mean) toward the participants. Then, participants were unknowingly put into a situation where they overheard the target’s interaction with the target’s supervisor who either complimented or disparaged the target. When asked later how much they were willing to offer their help to the supervisor, participants’ answers were coherent with the cognitive balance principle. They liked an enemy of their enemy more than a friend of their enemy and they liked a friend of their friend more than an enemy of their friend.

In addition to this behavioral demonstration of balance theory, more recent studies have supported cognitive balance through both implicit and explicit measures (Gawronski, Strack, & Bodenhausen, 2009). For instance, Gawronski, Walther, and Blank (2005) conducted experiments where they first provided positive or negative information about a source and afterward presented if the source likes or dislikes targets. Participants’ liking toward the targets was measured by two ways: an explicit question and an implicit measure (i.e., affective priming).

Results showed that both measures reflected cognitive balance. Participants liked the targets who were liked than disliked by a positive source and at the same time they liked the targets who were disliked than liked by a negative source. The researchers additionally demonstrated that this cognitive balance effect disappeared when participants did not receive positive or negative information about a source beforehand but instead received it later than the relationship information between a source and targets. These results further confirmed that pre-existing attitude toward a person triggers cognitive balance.

The current study involves neutral sources for whom participants do not have any prior information and targets toward whom participants receive negative or neutral or positive prior information at the start of the experiment. After forming positive or neutral or negative attitudes toward targets, participants read a message from the neutral source describing targets' positive or negative behaviors. If participants indeed follow the cognitive balance principle in forming attitudes toward the source, a different set of predictions can be made against H1.

First, consider a case where message recipients like a target (P + O) and a source describes a target's positive trait (X + O). In this case, for cognitive balance, the recipients are supposed to like the source (P + X). This general liking for the source is also likely to be reflected on a specific trait evaluation of the source (Nisbett & Wilson, 1977). For example, when people like Mandy and they hear John talks about Mandy's honest behavior, they are supposed to like John, and rate John highly on honesty if asked.

Now consider an opposite case. Suppose message recipients dislike a target (P - O) and a source describes a target's positive trait (X + O). In this case, for cognitive balance, the recipients are supposed to dislike the source (P - X). This general disliking for the source is also

likely to be reflected on a source-(target's) trait association. People in this case would rate John lowly on honesty if asked.

Using the STT terms, the pattern combining the first case and the second case can be described as follows: When a message describes a target's positive trait, the more positive message recipients' initial attitude toward target, the stronger the source-trait association. To understand this, it is important to note that the source-trait association only refers to the association with the very trait the message describes. That is, the source-trait association varies depending on the message. In the example above, as John describes honesty, the source-trait association for John is how much association message recipients make between John and honesty, not any other traits. Recognizing this nature of the source-trait association is also important for understanding of the following two cases concerning messages describing a negative trait.

Now consider a third case where message recipients like a target (P + O) and a source describes a target's negative trait (X - O). In this case, for cognitive balance, the recipients are supposed to dislike the source (P - X). This general disliking for the source is also likely to be reflected on a source-(target's) trait association. For example, when people like Mandy and they hear John talks about Mandy's lazy behavior, they are supposed to dislike John, and rate John highly on laziness if asked.

A fourth case is where message recipients dislike a target (P - O) and a source describes a target's negative trait (X - O). In this case, for cognitive balance, the recipients are supposed to like the source (P + X). This general liking for the source is also likely to be reflected on a source-(target's) trait association. People in this case would rate John lowly on laziness if asked.

In sum, even though the first and second cases feature a target's positive trait and the third and fourth cases feature a target's negative trait, as the source-trait association is measured by the association with the very trait a source describes, the predictions on how message recipients' initial attitudes toward target affect the source-trait association are exactly the same between cases concerning positive traits and those concerning negative traits. That is, regardless of the valence of a trait, the more positive message recipients' initial attitudes toward target are, the stronger the source-trait association. Thus, the following hypothesis based on the cognitive balance theory is put forward for all four cases (see Figure 2 for a visual depiction).

H2: The more positive message recipients' initial attitudes toward a target, the more likely they are to associate the target's trait with a source.

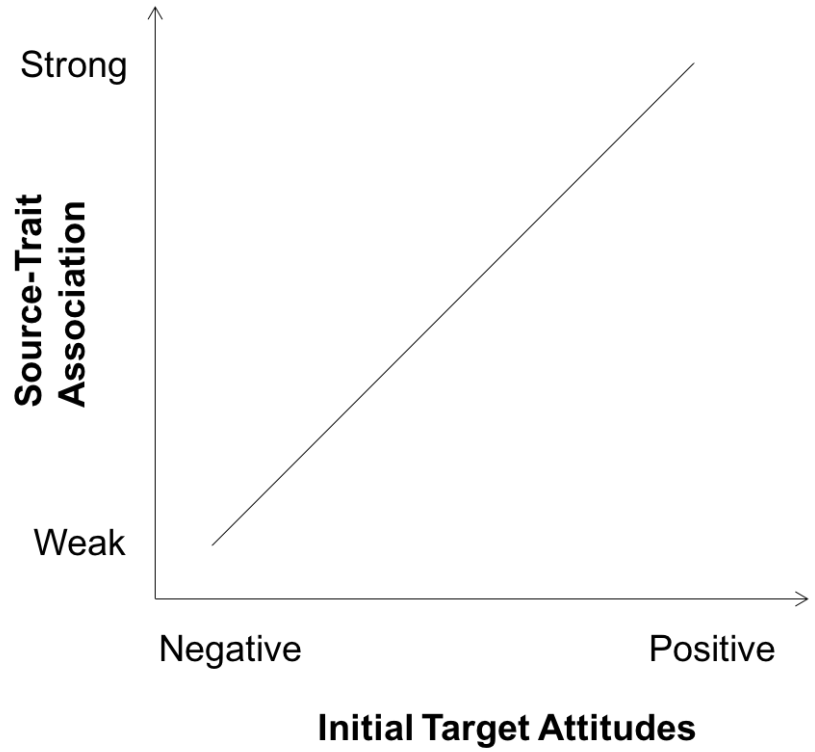

Figure 2. A visual depiction of H2.

As Figure 1 and Figure 2 illustrate, H1 and H2 predict different patterns from one another regarding the effect of initial attitudes toward target. To be more specific, whereas H1 states that

the less extreme the message recipients' initial attitudes, the stronger the source-trait association, H2 states that the more positive the message recipients' initial attitudes, the stronger the source-trait association. Put another way, whereas H1 predicts an inverted U-shaped pattern between initial attitudes toward target and the source-trait association, H2 predicts a positive linear pattern between them. To help understand the comparison between H1 and H2, Table A1 also summarizes how source-trait associations between conditions vary. The main difference between H1 and H2 lies in the prediction for when initial attitudes toward the target are positive: H1 predicts weak source-trait association, whereas H2 predicts strong source-trait association. The following method section describes an experiment that is designed to determine which prediction between H1 and H2 is correct.

METHOD

Study Design and Participants

This study employed a 3 (initial attitude toward target: positive vs. neutral vs. negative) x 3 (target's trait inferred from source's message: positive trait vs. negative trait vs. no trait) between-subjects web experiment. Prior to reading stimulus messages, message receivers' initial attitudes toward targets were manipulated by presenting them with positive (to induce a positive initial attitude) or negative (to induce a negative initial attitude) or neutral information about targets (to induce a neutral initial attitude). Having formed an initial attitude toward targets, some participants read stimulus messages where a source described the target's (positive or negative) trait-implying behavior. Although H1 and H2 did not predict different results in terms of the valence of target's trait inferred from a message and a previous study (Shin & Walther, 2016) found no significant difference between positive traits and negative traits on the occurrence of STT, both positive and negative traits were included in the current study to increase the generalizability of findings. Other participants read stimulus messages where a source described the target's generic behavior which did not imply any specific trait. This no-trait-implying message condition was added as a baseline control condition to test if other message conditions indeed show STT more than the baseline condition because STT should occur when message recipients infer a specific trait from a message to associate with a source.

To estimate the number of participants needed to test the predictions, the current study performed a statistical power analysis using the software package, G*Power (Faul, Erdfelder, Lang, & Buchner, 2007). The effect size was obtained from a recent study (Shin & Walther, 2016) that used a similar web-based design to investigate STT in the context of social media. The average effect size of the difference between trait-implying conditions and no-trait-implying

conditions on source-trait association scores was Cohen's $d = 0.56$. The statistical power ($1 - \beta$) to detect an effect was set at .80. The power analysis revealed that the sample size needed for each condition would be $n = 40$ in order to reach statistical significance at the $p < .05$ level for a one-tailed test. Based on the result, the current study recruited approximately 40 participants for each of nine experimental conditions. A total of 370 participants voluntarily took part in this study in exchange for $1.50. All data collection was conducted using Amazon Mechanical Turk (MTurk) to obtain a more representative sample of the general public in the United States than through a convenience sampling using college students (Berinsky, Huber, & Lenz, 2012). The participants consisted of 200 men (54.1%) and 170 women (45.9%), with an average of 35.58 years ($SD = 10.39$, range = 18 - 74). Participants identified themselves as Caucasian (74.9%), African-American (8.9%), Asian/Pacific Islander (7%), Hispanic (5.7%), Native American (1.1%), and other races (2.4%).

Induction

Initial attitude toward targets

Following the method of Gawronski and Walther (2008), participants were instructed, prior to reading stimulus messages, to imagine they were new employees of a company and thus were interested in getting to know their colleagues. Depending on their experimental conditions, participants received four positive, negative, or neutral statements about each of the four colleagues with whom they were supposed to work. These four colleagues were the targets in the stimulus messages which would be presented later. Participants assigned to the positive initial attitude condition read a total of 16 positive statements about four targets. For example, they read statements such as "Nick likes to help new colleagues to incorporate." In contrast, participants assigned to the negative initial attitude condition read 16 negative statements about four targets.

For example, they read statements such as “Ellie often insults the secretary.” (These examples were taken from Gawronski and Walther (2008)). Finally, participants assigned to the neutral initial attitude condition read four neutral statements about four targets. For example, they read statements such as “Nick uses a cellphone.”

The statements, designed to induce positive, negative, or neutral initial attitudes toward targets, were tested on MTurk to ensure a set of statement helped people form the expected attitudes toward targets. A first pilot test recruited 61 individuals (37 men, 24 women, Age M = 35.02, SD = 10.23 years) who were randomly assigned to read all positive or all negative or all neutral 25 statements about a target. This method was undertaken to reduce any artifact that may have arisen from the comparison between positive, negative and neutral statements simultaneously. In addition, to avoid any order effect, these messages were presented in random order. After reading each statement, participants indicated their attitude toward the person who was described in the message on a 7-point bipolar scale with 5 items (Roskos-Ewoldsen, Bichsel, & Hoffman, 2002; α = .97, M = 4.55, SD = 1.61). The five items included: negative (1) – positive (7), unfavorable – favorable, con – pro, unappealing – appealing, and unlikable – likable. After computing the mean of five scores for each statement, the 16 statements whose mean scores were significantly higher than the scale midpoint (4) were selected for inducing positive initial attitudes for four targets in the main experiment (M = 5.87, SD = 0.77), t (20) = 11.09, $p < .001$. For inducing negative initial attitudes, the 16 statements whose mean scores were significantly lower than the scale midpoint were selected (M = 2.63, SD = 0.90), t (19) = -6.82, $p < .001$. Finally, the 16 statements whose mean scores were close to the scale midpoint were selected for inducing neutral initial attitudes (M = 4.56, SD = 0.64). Independent-samples t-tests confirmed that the selected neutral messages induced significantly lower attitude scores than the selected

positive messages, t (39) = -5.90, $p < .001$, and significantly higher attitude scores than the selected negative messages, t (38) = 7.85, $p < .001$.

To further ensure that a set of statements for each target could effectively induce positive or neutral or negative attitudes toward targets, a second pilot test was conducted with the statements that passed the first pilot test. The main purpose of this second pilot test was to check additionally whether each set of four statements for a target could induce relatively firm attitudes in people. Another group of participants (N = 59, 31 men, 28 women, Age M = 34.34, SD = 9.69 years) were recruited in MTurk. The participants were then randomly assigned to positive or negative or neutral conditions where they read four sets of four statements that were designed to induce certain attitudes about each of the four target persons. Each set of statements were composed by randomly selecting four statements that passed the first pilot test in each condition. After reading each set of four statements about a person, participants first indicated their attitude direction toward the person on the same scale used in the first pilot test (Roskos-Ewoldsen, et al., 2002, α = .99, M = 4.34, SD = 2.11). Afterwards, they indicated how certain they were about their attitudes on a 7-point scale (Krosnick et al., 1993, α = .97, M = 4.43, SD = 1.74). The scale included the following 5 items (1 = *Not at all*; 7 = *Extremely*): "How certain are you of your feeling about this person?", "How sure are you that your opinion on this person is right?", "How firm is your opinion on this person?", "How definite is your view about this person?", and "How convinced are you about this person?".

After computing the average scores on the attitude direction scale and on the attitude certainty scale, each set of four statements were first tested to see if it induced attitudes in the intended direction using the same method taken in the first pilot test. One-sample t-tests confirmed that all four sets of positive statements had significantly higher scores than the scale

midpoint (4), (M = 6.03, SD = 1.24), t (20) = 7.52, p < .001, and all four sets of negative statements had significantly lower scores than the scale midpoint, (M = 1.77, SD = 0.75), t (18) = -13.03, p < .001. Also, independent-sample t-tests confirmed that all four sets of neutral statements (M = 5.04, SD = 0.90) induced significantly lower attitude scores than the sets of positive statements, t (38) = -2.87, p = .01, and significantly higher attitude scores than the sets of negative statements, t (36) = 12.16, p < .001.

Next, each set of four statements were tested to see if the average score on the attitude certainty scale was significantly greater than the scale midpoint (4) to ensure that these statement sets establish firm initial attitudes. Results showed that one set of negative statements did not produce significantly higher attitude certainty compared to the scale midpoint and thus another set was tested using the negative statements that passed the criterion in the first pilot test. Except this one set, all positive or negative sets of statements showed significantly higher attitude certainty compared to the scale midpoint; for positive statements (M = 4.89, SD = 1.26), t (20) = 3.24, p = .004, for negative statements (M = 5.09, SD = 1.55), t (18) = 3.06, p = .01. Also, a newly tested set of negative statements with new participants (N = 21, 12 men, 9 women, Age M = 32.86, SD = 11.39 years) showed a significantly lower attitude score than the scale midpoint, t (20) = -16.81, p < .001, as well as higher attitude certainty than the scale midpoint, t (20) = 4.77, p < .001, and thus was used in the main experiment. However, all four sets of neutral statements (M = 3.33, SD = 1.81) did not produce significantly higher or lower attitude certainty compared to the scale midpoint, t (18) = -1.61, p = .12, which was not surprising as they described very generic behavior that did not imply any unique characteristics of targets. As the core requirement needed for neutral target statements was not to induce firm positive or firm negative target

attitudes, the result was not a concern for the current study. The final selected statements for all experimental conditions are provided in Table B1.

Stimulus messages from sources

After completing the task to form initial attitude toward targets, participants were instructed to imagine seeking out on social media more information about each of their colleagues. The information they found was how other people on social media had talked about their colleagues. They then read four stimulus messages where an unknown-source individual described a behavior of their colleague.

Stimulus messages were formatted as Twitter messages. Twitter is one of the most widely used social media platforms (eBizMBA, 2015) where people post short messages within 140 characters and connect with other users. Unlike other platforms such as Facebook, Twitter users do not necessarily follow their offline acquaintances but follow unknown people who share similar interests. They also often search posts about certain topics they are interested in, using keywords (known as "hashtags") such as a celebrity's name. This public nature of Twitter makes it a particularly appropriate environment to study how people form impressions online about an unknown source. In addition, it is a natural setting where one person describes another person in a short message that may result in a quick, piecemeal impression formation about the source.

To ensure that prior source attitudes were neutral, the writers of Twitter messages (i.e., source) were made up using very common names based on the U.S. Census data (2000). In addition, the profile pictures of the sources were the default avatars given by Twitter to eliminate any effect from idiosyncratic visual appearances of each source. The color of the avatar for each source was varied to highlight that each message was written by a different source (see Figure 3 for stimulus examples).

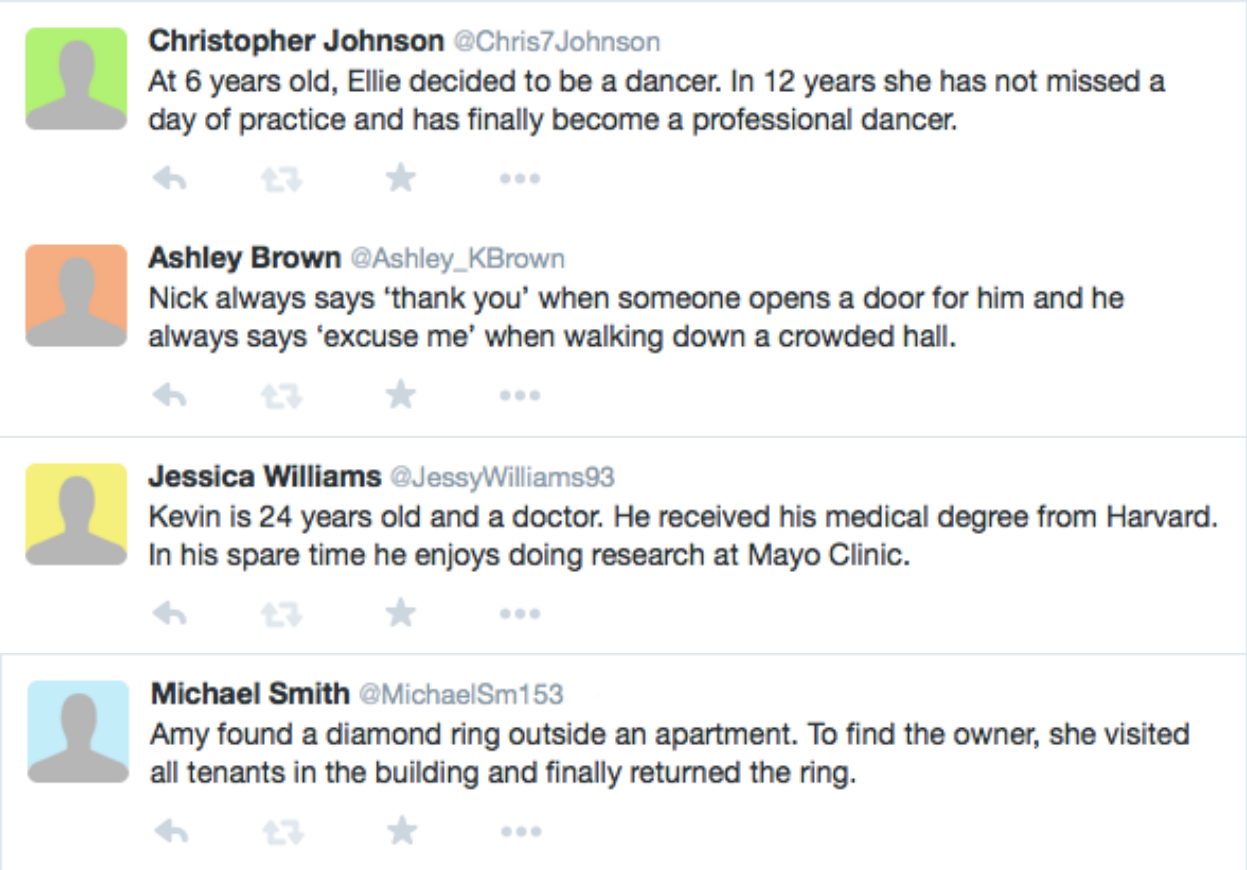

Figure 3. Stimulus example for positive-trait-implying messages.

Three different versions of Twitter messages were created (positive target trait vs. negative target trait vs. no target trait). To increase generalizability of results to various trait judgments, the current study showed participants four messages which described four different traits in each condition following the method taken from a previous study (Shin & Walther, 2016). In addition, each message had a different pair of sources and targets. For example, participants in the positive-trait-implying message condition read four Twitter messages, each of which described a target's positive traits such as honesty, politeness, intelligence, and dedication. Negative-trait-implying messages described a target's negative traits such as impatience, laziness, sloppiness, and cheapness. No-trait-implying messages described a target's generic behavior which did not clearly suggest a particular trait. All stimulus messages were taken from

previous studies (Carlston & Skowronski, 1994; Shin & Walther, 2016) and they passed the pilot test in the previous studies to check if each message implied each corresponding trait or no particular trait correctly (See Table B2 for messages). To eliminate any order effect, the order of four Twitter messages was randomized for each participant.

Procedure

On the MTurk website, participants viewed a link to an external experimental website. Once accessing the experimental website, participants read a consent form explaining the purpose of the current study and the expected compensation of $1.50 upon completion. After giving their consent, participants were randomly assigned to one of nine experimental conditions.

The first task for participants was to form an initial attitude toward targets. Participants were instructed to imagine starting a new job at a company and receiving information about their new colleagues. After reading the given information about their colleagues, they indicated how positively or negatively they felt toward each of them. Then, they moved on to the next task.

The second task for participants was to form an attitude toward sources. Participants were instructed to imagine having searched and found more information about their new colleagues on Twitter. After reading each of four Twitter messages where an unknown source described their colleague's trait-implying behavior, participants rated the extent to which they thought each source possessed a set of traits including the trait implied in the message stimulus (i.e., source-trait association) and other filler traits. Upon completion of rating all four sources, they were asked to provide their demographic information (age, gender, ethnicity) and received monetary compensation for their participation.

Measurement

Main variables

For measuring source-trait association, participants rated the extent to which they thought each source possessed a set of traits on a 7-point Likert-type scale (1 = *Not at all*; 7 = *Extremely*) that included the trait implied in the message stimuli (adapted from Crawford et al., 2007; Shin & Walther, 2016). To make it clear that the question was asking about a source, not a target, the identity of the source was highlighted in bold and underlined in the questions ("e.g., Please rate how much **Sarah who wrote the Twitter message** seems to possess the following traits"). The scale included 16 items, with 4 items measuring one trait. Items measuring honesty were: honest, trustworthy, credible, truthful. Items measuring politeness were: polite, well-mannered, civil, courteous. Items measuring intelligence were: intelligent, smart, bright, clever. Items measuring dedication were: dedicated, resolute, devoted, committed. Items measuring impatience were: impatient, intolerant, hasty, short-tempered. Items measuring laziness were: lazy, sluggish, inactive, idle. Items measuring sloppiness were: sloppy, negligent, unsystematic, careless. Items measuring cheapness were: cheap, miserly, stingy, penny-pinching. The same scale was used for all source evaluations in every experimental condition.

A confirmatory factor analysis (CFA) using the iterated centroid estimation (Anderson, Gerbing, & Hunter, 1987; Hunter & Gerbing, 1982) tested the 8-factor measurement model with one trait as one factor to check if four items measured each corresponding trait correctly, not measuring other traits. The CFA used *corCFA* function in *lessR* package (Version 3.6.2; Gerbing, 2017) in R. Results showed that all factor loadings were ample (range = .83 - .96), and the average residual was small, RMSE = .028. Reliability coefficients (Cronbach's α) were computed for each trait and they were high across all traits (α = .94 ~ .97). To analyze the

strength of the source-trait association for each source, the mean score of the four items measuring the implied trait was computed for each trait-implying message. A detailed report of means, standard deviations, and reliability coefficients of each trait association is provided in Table C1.

For measuring initial attitude toward a target, after reading each set of statements designed to induce certain attitudes toward a target, participants indicated their attitude toward the target on a 7-point bipolar scale with 5 items (Roskos-Ewoldsen et al., 2002). The five items were: negative (1) – positive (7), unfavorable – favorable, con – pro, unappealing – appealing, and unlikable – likable. A CFA result confirmed that all factor loadings were ample (range = .98 - .99), and the average residual was very small, RMSE = .002. The mean score of the five items was computed for induction check and hypothesis testing (M = 4.41, SD = 2.23, α = .99).

Supplemental variables

For measuring target attitude accessibility, after participants rated their initial attitudes toward all four targets on the above 5-item scale, they were again instructed to express their opinion on each target on a single-item attitude scale. The target attitude accessibility was measured by the response latency to the single-item scale in milliseconds. The current study purposefully measured attitude accessibility separately from the measurement of initial target attitudes to (1) measure the accessibility of already established attitudes, and to (2) avoid potential biases of averaging out multiple response latencies such as respondent's fatigue. A Pearson product-moment correlation coefficient showed that the 5-item target attitude was highly correlated with the single-item target attitude, r (370) = .99.

Participants first read an instruction that asked them to answer a question on the next page as quickly as possible while making sure their response reflected their attitude accurately.

They then clicked on the 'next' button when they were ready to answer a question. For each target, participants answered to the following question, "Your opinion about (a target's name) is …." on a 7-point bipolar scale (1 = *Extremely negative*; 7 = *Extremely positive*). The survey system recorded the time each participant spent between exposure to the question and answering the question. The less time a participant took to answer an attitudinal question, the more accessible the attitude was (Fazio, 1990).

Since response latency distribution is typically highly skewed as was the case here (skewness range = 3.19 – 18.06), the raw scores of response latency were submitted to a reciprocal transformation (1/response latency) and were multiplied by 1000 to avoid rounding errors of small numbers. After the data transformation, the higher the score, the greater the attitude accessibility. This method of measuring attitude accessibility and data transformation followed the standard recommendation from previous studies (e.g., Elliott, Lee, Robertson, & Innes, 2015; Fazio, 1990; Roskos-Ewoldsen, Yu, & Rhodes, 2004). Attitude accessibility scores were used for exploring the mediation behind H1 such that the more extreme the initial target attitude, the higher the attitude accessibility, and the less likely STT was to occur. The mean of target attitude accessibility was 2 milliseconds, and standard deviation was 5.60 milliseconds.

For measuring general attitude toward a source, after rating a source's association with a target's trait, participants also indicated their general attitude toward the source on the same 7-point, 5-item scale used for measuring initial attitude toward a target (Roskos-Ewoldsen et al., 2002). Again, a CFA result was satisfactory with ample factor loadings (range = .94 - .96) and small average residual, RMSE = .002. The mean score of the five items was computed for supplemental analysis to explore the mechanism of H2, which presumed source-trait association would reflect participants' general liking toward the source (M = 4.43, SD = 1.46, α = .98).

RESULTS

Induction Check and Preliminary Analysis

Prior to testing the research hypotheses, the current study first checked whether the induction for initial attitudes toward targets was successful. A series of planned contrast analyses was conducted to test if the three initial target attitude conditions (positive vs. neutral vs. negative) indeed had the intended pattern of attitudes toward targets. The contrast weights for each condition were as follows: positive (+1), neutral (0), negative (-1) initial target attitudes. The dependent variable was the mean of the five items which measured target attitudes in the first task. The same analysis was repeated for four targets. Results showed that the planned contrast was significant at the level of $p < .001$ across all four targets. In addition, a series of post-hoc analyses using the Tukey HSD method confirmed that targets in the positive initial attitude condition were rated significantly more positively than targets in the neutral initial attitude condition at the level of $p < .05$, which were in turn rated significantly more positively than targets in the negative initial attitude condition at the level of $p < .05$, across all four targets. A detailed report of the results for each target is provided in Table C2. In conclusion, the induction for initial attitudes toward targets was successful.

Secondly, before testing the effect of varying attitudes toward targets on the spontaneous trait transference, the current study checked if the spontaneous trait indeed occurred. To verify the occurrence of the spontaneous trait transference, it compared people who read trait-implying messages and those who read no-trait-implying messages on their source-trait associations. Hence, a series of independent samples *t*-tests were conducted on each of the source-trait associations. For instance, to see if people who read an intelligence-implying message from a source were more likely to associate intelligence with the source, a *t*-test compared those who

read the intelligence-trait-implying message and those who read a no-trait-implying message on their source-intelligence association scores. The same procedure was repeated for each of the eight traits.

Results showed that the spontaneous trait transference occurred for seven out of eight traits. For instance, people who read an intelligence-implying message rated the source as being significantly more intelligent than those who read a no-trait-implying message from the same source. The only exception was the source-honesty association. There was no significant difference in source-honesty association between people who read an honesty-implying message and those who read a no-trait-implying message. A detailed report of the results for each trait association is provided in Table C3. In sum, the majority of the results (7 out of 8 cases) confirmed that people associated a source with a target's trait, supporting the occurrence of spontaneous trait transference. This result, however, should be interpreted together with the hypothesis testing results below as it only reflects the main effect of the presence of target's trait, not considering the presence of initial attitudes toward targets.

Hypothesis Test

Planned contrasts and regression analysis

In order to test the competing hypotheses, H1 and H2, the present study conducted a series of planned contrast analyses. As H1 predicted that the more extreme the message recipients' initial attitudes toward a target, the weaker the source-trait association, the contrast weights for testing H1 were as follows: negative (-1), neutral (+2), positive (-1) initial attitudes toward targets. The dependent variable was source-trait association for each trait. For instance, for participants who saw a source describe a target's honest behavior, a planned contrast was conducted on the source-honesty association. The same procedure was repeated for each of eight

traits. Results showed that the planned contrasts reflecting H1 were not significant for any of the eight traits. Therefore, H1 was not supported by the data. A detailed report of the results for each trait association is provided in Table C4.

As opposed to H1, H2 predicted that the more positive the message recipients' initial attitudes toward a target, the stronger the source-trait association. To test H2, the same procedure was performed as for H1, except the contrast weights for each experimental condition of initial attitudes toward targets. The contrast weights for testing H2 were as follows: negative (-1), neutral (0), positive (+1) initial attitudes toward targets. Results revealed that five out of eight tests on various source-trait associations turned out significant at the level of $p < .05$ (one-tailed). The five traits were honesty, intelligence, politeness, impatience, and laziness. Among the remaining three traits, two traits (dedication, sloppiness) were marginally significant at the level of $p < .10$ (one-tailed). A detailed report of the results for each trait association is provided in Table C4. In conclusion, H2 received stronger support than H1.

To further investigate if contrast results missed anything in terms of the general effect of initial attitudes toward targets by categorizing initial attitudes into three categories – positive, neutral, and negative – instead of treating it as a continuous variable, the current study performed a series of regression analyses using the target attitudes measured for induction check. First, initial attitudes toward targets were centered by subtracting the grand mean from each score, and the centered scores were squared. Second, both the original initial attitude scores (i.e., linear term) and the centered-and-then-squared scores (i.e., quadratic term) were entered as predictor variables into the regression analysis. The outcome variable was each source-trait association. If results show that the regression coefficient of the quadratic term is significant while the

regression coefficient of the linear term is not significant, it means that the data support H1. If the opposite is true, it means that the data support H2.

A series of regression analyses revealed that there was a difference between positive-trait-implying message conditions and negative-trait-implying conditions. First, when the outcome variable was any of the positive source-trait associations (e.g., honesty), the regression model was significant, and both regression coefficients of linear term and quadratic term were significant. The regression coefficient of linear term was positive, which indicated that as initial attitudes toward targets change from being negative to being neutral, and to being positive, the source-trait association became stronger. This pattern was predicted by H2, and thus the data supported H2. In contrast, although the regression coefficient of quadratic term was significant but it was positive, which suggested a convex pattern (i.e., the source-trait association decreases first and then increases as initial attitudes toward targets change from being negative to being neutral, and to being positive), opposite to a concave pattern (i.e., the source-trait association increases first and then decreases as initial attitudes toward targets change from being negative to being neutral, and to being positive) predicted by H1. The same pattern of results appeared across all four positive traits. Thus, the data supported H2, but not H1, for positive-trait-implying message conditions (see Table C5 for detailed reports).

However, for negative-trait-implying conditions, the results were not consistent across all four negative traits. First, three out of four regression models were not statistically significant, which suggested that neither a linear term nor quadratic term could well explain the relationship between initial attitudes toward targets and source-trait associations. The only exception was laziness. In the regression analysis with source-laziness association as the outcome variable, the linear term was not statistically significant, but the quadratic term was significant and negative.

This suggested that at least for the source-laziness association, the data supported H1, but not H2. Given this result was only shown for one out of four regression models, however, support for H1 is extremely weak. Considering the possibility of Type I error, it would be more reasonable to conclude that the data supported neither H1 nor H2, for negative-trait-implying message conditions (see Table C5 for detailed reports).

Mixed-effects analysis

Since contrast analyses and regression analyses revealed some differences between traits, it was necessary to see if there was an overall effect of initial target attitudes on source-trait association after statistically considering the variance due to different traits. As a linear mixed-effects analysis can simultaneously show if the effect of an independent variable (i.e., fixed-effect factor) on a dependent variable is significant while estimating how much the effect varies or how much baseline differences exist based on other random factors such as different traits and different participants, the current study re-tested H1 and H2 using a linear mixed-effects analysis. The current study used the R package "lme4" (Bates, Mächler, Bolker, & Walker, 2015). For fixed-effect factors, the analysis used the linear term and quadratic term of initial target attitudes that were calculated for previous regression analyses to predict source-trait associations. Random-effect factors were traits and participants. At first, the analysis allowed each participant to have varying intercepts (i.e., random intercept for participants) and varying slopes for the linear term of initial target attitude and varying slopes for the quadratic term of initial target attitudes (i.e., two random slopes for participants) and covariances between random effects (i.e., the covariance between a random intercept and a random slope for participants). It also allowed different trait stimulus to have varying intercepts and varying slopes for the linear term and the quadratic term of initial target attitudes and covariances between random effects.

Thus, the initial model had two fixed-effect factors and ten random-effect factors to predict source-trait association scores. After fitting the initial model, each random-effect factor was removed in a stepwise manner to test if its inclusion significantly improved the model fit. Likelihood-ratio tests based on ML estimates were used for model comparisons.

The final model included two fixed-effect factors (linear term, quadratic term of initial target attitudes) and two random-effect factors (random intercept across different traits, random intercept across participants). The outcome variable was source-trait association scores. The equation for the final model can be described as follows: $Y_{ij} = (b_0 + u_i + u_j) + b_1X_{1ij} + b_2X_{2ij} + e_{ij}$, where Y_{ij} is the source-trait association score of a participant i rating trait j, b_0 is the intercept, u_i indicates the change in the intercept for the participant i, u_j indicates the change in the intercept for trait j, b_1 indicates the effect of the linear term of initial target attitudes X_{1ij}, b_2 indicates the effect of the quadratic term of initial target attitudes X_{2ij}, and e_{ij} is an error term. The final model was run using the REML criterion. The R syntax for the final model is provided in the Appendix.

The analysis revealed that the linear term of initial target attitudes was statistically significant, $b = 0.13$, $SE = 0.03$, $t = 4.48$, 95% CI [0.08, 0.19]. In contrast, the quadratic term of initial target attitudes was not statistically significant, $b = 0.004$, $SE = 0.02$, $t = 0.23$, 95% CI [-0.03, 0.03]. In addition, random-effect estimates showed that the intercepts of the model varied across traits ($SD = 1.17$), suggesting the baseline difference between traits on source-trait association. A more detailed report of this model is provided in Table C6. In sum, results supported H2, not H1, after considering differences among trait stimuli and individual differences among participants. The more positive initial attitudes toward targets, the stronger the source-trait associations.

Supplemental Analysis

To better understand the mechanism of the hypothesized effects of initial target attitudes, the current study performed some supplemental analyses. The first analysis investigated the role of attitude accessibility. Hypothesis 1 assumed that more extreme initial attitudes toward targets would have a greater attitude accessibility, which would consequently reduce the likelihood of source-trait associations. Although results from hypothesis testing repeatedly showed that the data did not support H1, it is still an interesting question to investigate where the missing link lies: the link between extremity of initial attitudes and attitude accessibility vs. the link between attitude accessibility and source-trait associations.

To answer the question, the current study first conducted a mixed-effects analysis with target attitude extremity as a predictor and target attitude accessibility as an outcome variable. The target attitude extremity was computed as the absolute difference between each participant's target attitude score and the scale midpoint (4) (Powell & Fazio, 1984). The target attitude accessibility was the response latency to the single-item target attitude scale. As H1 and H2 were tested for the data excluding the control conditions (i.e., no-trait-implying message conditions), for a better comparison, this mixed-effects analysis was also conducted on the data excluding the control conditions. The analysis used REML criterion for model fit and allowed random intercept for participants. Other random-effect factors such as random intercept for different targets were excluded as they did not improve the model fit. Results showed that target attitude extremity was a significant predictor of target attitude accessibility, b = 52.80, SE = 22.94, t = 2.30, 95% CI [7.87, 97.76]. As predicted, more extreme target attitudes led to greater target attitude accessibility.

Given that the assumed link between target attitude extremity and target attitude accessibility was supported, it was more likely that H1 failed due to the second link between target attitude accessibility and source-trait associations. To check this possibility, another mixed-effects analysis was performed with target attitude accessibility as a predictor and source-trait association as an outcome variable. This analysis allowed random intercepts for different trait stimuli and for participants. Results showed that target attitude accessibility was not a significant predictor of source-trait association, b = -0.00005, SE = 0.00006. t = -0.80, 95% CI [-0.0002, 0.00007]. Thus, H1 failed to receive support because greater target attitude accessibility did not decrease the likelihood of the association between a source and a target's trait.

The second supplemental analysis explored the mechanism behind H2. The hypothesis presumed that people's attitudes toward a source would be determined to maintain their cognitive balance and the resulting general attitudes would be reflected in source-trait associations. In other words, general attitudes toward a source was a mediator for the effect on source-trait association. In order to check if general source attitudes indeed mediated the effect of initial target attitudes, the current study performed the exact same mixed-effects analysis as the one that tested H1 and H2, except replacing specific source-trait associations with general source attitudes for an outcome variable. Fixed-effect predictors were the linear term and the quadratic term of initial target attitudes, and random-effect factors were two random intercepts for trait stimuli and participants. Results showed that neither the linear term of initial target attitudes, b = 0.03, SE = 0.03, t = 0.92, 95% CI [-0.03, 0.09] nor the quadratic term of initial target attitudes, b = 0.02, SE = 0.02, t = 1.16, 95% CI [-0.01, 0.05] significantly predicted general source attitudes. Thus, the suspected mediating role of general source attitudes for H2 did not receive support from the data.

The third supplemental analysis investigated if a specific source-trait association was generalized to other source-trait associations with the same valence. Observing this spillover tendency would answer a question whether the stimuli participants in each experimental condition were exposed to affected other source-trait associations as well, not just the focal source-trait associations. To investigate this question, a series of correlational analyses was conducted between each focal source-trait association and other filler source-trait associations with the same valence for each trait-implying message. For example, when people read an honesty-implying message, the focal source-trait association was source-honesty association, and other filler source-trait associations were source-politeness, source-intelligence, source-dedication associations. Results showed that all Pearson product-moment correlation coefficients were positive and statistically significant, r = .23 - .89 (see Table C7 for each correlation coefficient). This suggested an existence of a spillover effect. In other words, people who evaluated a source as having a positive (vs. negative) trait tended to evaluate the source as having other positive (vs. negative) traits as well.

DISCUSSION

The present study investigated how people's initial attitudes toward targets affect spontaneous trait transference (STT) in the context of social media. Results indicated that having prior attitudes toward targets facilitated cognitive balance, not STT. People's source-trait association reflected cognitive balance such that they rated a source who positively described a target they liked more highly on positive traits than a source who positively described a target they disliked. General attitudes toward sources, however, did not show significant differences predicted by cognitive balance.

Theoretical and Practical Implications

This study was a first attempt to test if and how existing target attitudes affects STT. Previous research on STT has primarily focused on situations where people hear about a previously unknown target from an unknown source (e.g., Skowronski et al. (1998)). Although there were some exceptions using celebrity sources to find out how existing attitudes toward sources affect STT (Mae et al., 1999), no study before the current study has investigated the issue of existing attitudes toward targets discussed by sources. Given that people often communicate about others whom they already hold certain knowledge and attitudes about, the lack of research on the matter of existing target attitudes presented a crucial limitation on discussing the generalizability of STT. The findings of the current study help to fill in the gap in the literature.

Overall, the data demonstrated that people's tendency to achieve cognitive balance between relevant attitudes prevailed over STT when people already held certain attitudes toward targets. Although separate statistical analyses for each source-trait association suggested the cognitive balance tendency could have been stronger for positive trait evaluations than for

negative trait evaluations, the overall mixed-effects analysis that considered the differences between traits and differences between participants showed that the pattern predicted by cognitive balance theory better explained the data than did the prediction based strictly on the STT mechanism. Given all the mean differences in source-trait associations between negative, neutral, and positive existing target attitudes follow the linear pattern predicted by cognitive balance regardless of their statistical significance (see Table C4), the reason why the effect was not as strong as for negative traits could have been due to people's reluctance to judge a source negatively based on little information in an explicit manner. If so, the actual differences between different target attitudes could have been reduced. The fact that the grand means of negative-trait association scores are very low lends support to the suspected reluctance of people. This claim, of course, remains under suspicion until it is verified with an implicit measure for STT in future studies. Overall, the current data leads to a conclusion that when people hold certain attitudes toward targets, the urge to maintain the cognitive consistency dominates the process of attitude formation toward a source.

The supplemental analysis on the mechanism of H2, however, seems to raise a question about the cognitive balance effects. To argue that an explanation based on cognitive balance is correct, the data should show a similar result when the dependent variable is general attitude toward a source, not just a particular trait association. However, results revealed that H2 was not supported for general attitude toward a source. Thus, the assumption of H2 that people would first form their general favorability toward a source based on their initial target attitudes as well as the source's message toward the target, and consequently their trait judgments for the source would reflect the general source favorability, was not validated. This result also goes against the fact that there was a high positive correlation between trait judgments with the same valence.

The spillover tendency would make more sense if various trait judgments were based on the same root such as general source attitude. So what could be some possible explanations for the statistically null effect of initial target attitudes on general source attitudes?

There can be two reasons which are methodological rather than theoretical. First, sources in the current study never explicitly talked about who they were or what they thought or what kind of relationship they had with targets. Their messages only described a target's behavior. The facts that sources provided very little information about themselves and that there were no other means to find more information about them could have affected people's answers on the general source attitude scale. In other words, whereas people may have felt okay to judge a source on a particular trait (e.g., how honest this person seemed) when asked because the question was less related to the participants themselves and thus sounded more distant and objective, they could have felt more reluctant to make their final call explicitly when asked to tell how much they liked or disliked the source with very little direct information about the source. If people had the concern of looking like an unreasonable and easily swayed person, they could have underestimated or underreported their actual attitudes toward sources.

Secondly, the order of measurement could have reduced the extremity of reported source attitudes. In the main experiment, general source attitude was asked immediately after source-trait association measures. The source-trait association measures always included eight trait judgments with four positive traits and four negative traits. After being compelled to think about how likely a source had various positive traits and negative traits, people's global source attitudes could have become more neutral than when they first read the source's message. The reduced or compressed source attitude might explain the null effect of initial target attitudes on general source attitudes. Although having failed to reach the statistical significance, the pattern

of mean differences on general source attitudes shows a linearly increasing pattern with more positive target attitudes (see Table C8), suggesting that the pattern is at least coherent with the cognitive balance approach.

Going back to the results of hypothesis testing, the failure of H1 can be explained by the results of the supplemental analysis. Hypothesis 1 presumed that the more extreme the initial target attitude, the greater accessibility the target attitude would have. When the target attitude was easily accessible, the target would be more salient in the message recipients' minds, which would weaken spontaneous trait transference. The data supported the assumed positive relationship between target attitude extremity and target attitude accessibility as previous research evidence suggested (e.g., Fazio & Williams, 1986; Powell & Fazio, 1984). Thus, the failure of H1 was due to the null relationship between target attitude accessibility and source-trait associations. Why was there no statistically significant relationship between the two variables although it logically made sense? It is possible that target attitude accessibility could not make enough difference in target salience which was the most immediate conceptual meditator for weakening STT. As the current study did not measure the target salience, this possibility cannot be ruled out.

For one thing, it is most likely that people's target salience was high regardless of the extremity of target attitudes they held because they read prior information about targets and answered questions asking their attitude toward the targets repeatedly. If so, the results are consistent with previous research (Crawford et al., 2008) that claimed that the increased target salience facilitates a rational, attributional processing of a message which counteracts against an automatic, associative processing of a message. The overall high target salience could have promoted rational thinking about what the message says about the source-target relationship and

how to form cognitively consistent attitudes toward the source with given relational information and their existing target attitudes. This interpretation also aligns well with the claim that cognitive consistency requires propositional process based on a syllogistic approach as people need to determine the truthfulness of each proposition to achieve consistency (Gawronski et al., 2009). In line with previous research, the current finding appears to support that having prior attitudes toward targets prompts a more elaborate way of message processing and thereby mitigates automatic message processing leading to a false association between a source and a target's trait.

To conclude, the major implication of the current study is that it clarified an important theoretical boundary condition for STT. Results suggest that STT is reduced when message recipients have some knowledge about a target prior to a source's message about a target. The prior knowledge leads to prior target attitudes, which in turn motivates people to achieve cognitive balance between relevant attitudes. In other words, if a target is a perfectly blank slate to message recipients, STT is likely to occur. Otherwise, cognitive balance effect takes over. This study therefore enables us to have a much clearer picture about how a writer on social media who talks about another person can be perceived. If a writer – either previously known or unknown to readers - talks about a target with whom readers are not previously acquainted (e.g., introducing a new musician or an actor), people will associate the target's trait inferred from the message with the writer. Kind words will pay off for the writer and hurting words will hurt the writer back. However, if a writer talks about a target about whom readers have prior attitudes (e.g., talking about a well-known politician), people will like the writer when they share similar attitudes about the target and dislike the writer if they have contradicting views about the target.

In the end, STT has a limited influence as it only applies to situations where people hear about a target for the very first time.

Limitations and Future Directions

Along with the implications, some limitations of the current study should be noted. First, the present study manipulated initial attitudes toward targets, rather than measuring natural attitudes that existed before the experiment. This could have reduced the potential impacts of initial target attitudes as participants could not have a long enough time to establish their target attitudes fully before reading a source's message. The overall results of the data, however, clearly showed that the manipulated target attitudes were powerful enough to create an urge to maintain cognitive balance between relevant attitudes. Also, this way of manipulating target attitudes just prior to other stimuli has been successfully used in previous studies that investigated cognitive balance (e.g., Gawronski et al., 2005). Thus, it seems acceptable to say that even when people did not know a target long beforehand, once they form an attitude toward the target, the immediate attitudes can be a powerful force to achieve cognitive balance. Still, future studies would benefit from using targets for whom people already have certain attitudes such as their acquaintances or celebrities to increase the generalizability of the current finding.

Second, the current study only varied initial attitudes toward targets, not varying initial attitudes toward sources. By not considering how initial attitudes toward sources may interact with initial attitudes toward targets, the current study can only provide a partial picture of the effect of initial attitudes on STT. Previous research (Mae et al., 1999) investigated the role of initial attitudes toward sources and the current study investigated the role of initial attitudes toward targets. These studies can only provide separate pieces of knowledge which need further investigation that incorporates both elements to see how they interact with one another.

Third, the current study only used explicit measures, which could have been vulnerable to self-presentation concerns of participants. For instance, general liking toward sources might have been under-reported if participants felt reluctant to show they liked or disliked someone based on very little information, especially when they were motivated to think a little more deeply than usual by reading a message about a target they knew. Thus, future studies would benefit from using both implicit measures and explicit measures to avoid such a possibility.

CONCLUSION

Determining an impression of a person online is a complex process. Social media provides multifaceted information about a person, each of which exerts certain influence on the attitude formed toward the person. Based on a previous finding that people are associated with a trait they merely described of a third party on social media (Shin & Walther, 2016), the current study further investigated cases where both the writer of the message (i.e., source) and message readers have certain knowledge about the target described by the source. In so doing, it compared two very different approaches for attitude formation – one is associative and automatic as it simply occurs due to co-activation of two concepts, and another is relatively inferential and logical as it requires determining truth values of each proposition and finding a balanced conclusion. As Kahneman (2011) pointed out, people are by default inclined to have fast and automatic thought processes; however, the errors of automatic thinking can be overcome when people are motivated to think a little more slowly. The current study shows that having certain attitudes toward a target described by a source may prompt such a slower thought process and consequently prevent the error of automatic thought processes.

APPENDICES

APPENDIX A
SUMMARY OF HYPOTHESES

Table A1.
Predicted Strength of Source-Trait Association for Experimental Conditions

	Positive existing attitude toward target		*Neutral existing attitude toward target*		*Negative existing attitude toward target*	
	H1	*H2*	*H1*	*H2*	*H1*	*H2*
Positive Trait Message	Weak	Strong	Strong	Moderate	Weak	Weak
Negative Trait Message	Weak	Strong	Strong	Moderate	Weak	Weak

Note. This study does not compare the absolute strength of source-trait association between H1 and H2. Instead, the strength notification (weak, moderate, strong) represents how source-trait association changes across conditions within each hypothesis. For instance, in the condition where people's existing attitude toward a target is neutral and they receive a positive-trait-implying message, even though H1 predicts strong source-trait association and H2 predicts moderate source-trait association, the absolute source-trait associations they refer to can be equivalent. What matters is how the source-trait association in that condition compares to other conditions – whether it is highest among different pre-existing attitude conditions (H1) or whether it is in the middle between other two pre-existing attitude conditions (H2).

APPENDIX B
ATTITUDE INDUCTION AND MESSAGE STIMULI

Table B1.
Messages for Inducing Initial Attitudes toward Targets

Attitude Direction	*Message*
Positive	1. Ellie lends a helping hand when and where she can. 2. Ellie is empathetic enough to offer a shoulder to cry on. 3. Ellie cares for everyone around her. 4. Ellie is optimistic and enthusiastic. 5. Nick can see positive things in everyone. 6. Nick communicates with others very well. 7. Nick is trustworthy enough to keep secrets. 8. Nick likes to help new colleagues to incorporate. 9. Kevin is respectful of people's time. 10. Kevin expresses appreciation and acknowledgement to others. 11. Kevin meets deadlines and is organized. 12. Kevin responds to emails and calls promptly. 13. Amy brings snacks for her colleagues. 14. Amy is considerate of others. 15. Amy listens to worries of others. 16. Amy shares her resources with others.
Negative	1. Ellie is condescending. 2. Ellie is not a reliable person to share secrets. 3. Ellie often insults the secretary. 4. Ellie becomes angry and dramatic when her needs are not met. 5. Nick is egotistical. 6. Nick likes to use peer pressure to hold others back. 7. Nick draws people's attention to his problems every day. 8. Nick throws others under the bus when things do not go well. 9. Kevin is not a team player. 10. Kevin likes to spread rumor about others. 11. Kevin is a constant complainer. 12. Kevin rushes to grab the glory when things go well. 13. Amy rarely acknowledges or apologizes for her mistakes. 14. Amy blames others for mistakes. 15. Amy often says, "That's not my job" to her boss and colleagues. 16. Amy is often late to her work.
Neutral	1. Ellie works in an office. 2. Ellie has an email account. 3. Ellie usually has lunch around noon. 4. Ellie sometimes eats a sandwich. 5. Nick uses a cellphone. 6. Nick carries a bag to his work. 7. Nick drinks coffee.

Table B1 (cont'd).

Attitude Direction	*Message*
Neutral	8. Nick visits a hospital for a regular check-up. 9. Kevin has a laptop. 10. Kevin takes a shower either in the morning or evening. 11. Kevin has a Facebook account. 12. Kevin sometimes shops on the Internet. 13. Amy wears gloves when the temperature is low. 14. Amy drives a car. 15. Amy sometimes watches YouTube videos. 16. Amy wears glasses.

Table B2.
Message Stimuli

Condition	*Message*	*Distinctive Trait*
Positive Traits	Amy found a diamond ring outside an apartment. To find the owner, she visited all tenants in the building and finally returned the ring.	Honest
	Nick always says ‘thank you’ when someone opens a door for him and he always says ‘excuse me’ when walking down a crowded hall.	Polite
	Kevin is 24 years old and a doctor. He received his medical degree from Harvard. In his spare time he enjoys doing research at Mayo Clinic.	Intelligent
	At 6 years old, Ellie decided to be a dancer. In 12 years she has not missed a day of practice and has finally become a professional dancer.	Dedicated
Negative Traits	Amy leaves her clothes on the floor and her plate on the table not taking it to the kitchen. She leaves towels on the floor after a shower.	Sloppy
	Nick usually crawls out of bed at noon. He doesn't go out unless there's an appointment and always wants to sleep all day doing nothing.	Lazy
	Kevin does not like to spend money. He never goes to the mall. If he needs something, he goes to closeout stores and yard sales.	Cheap
	Ellie was in the bank and there was a wait. She squeezed past the two people in front of her and yelled she deserved prompt service.	Impatient
No Traits	Amy saw a pile of snow on her car in the morning. She started brushing off snow and chipping away ice on windows with a scraper.	None
	Nick bought a loaf of bread from a bakery to make a sandwich with it. He put cheese, lettuce, and ham in the sandwich.	None
	Kevin went back to his house to pick up some books. On the way back to school, he stopped and tied his shoelace.	None
	Ellie went to the movie theater with her friends. After buying her ticket for a new movie, she went to a concession stand to buy popcorn.	None

Note. The word in parentheses is a trait the message implies that was removed in the actual stimuli presented to participants.

APPENDIX C
ANALYSIS RESULTS

Table C1.
Descriptive Statistics of Source-Trait Associations

	Mean	*SD*	α
Honest	4.91	1.34	.96
Dedicated	4.33	1.35	.95
Intelligent	4.39	1.31	.96
Polite	4.62	1.56	.97
Sloppy	2.49	1.41	.95
Impatient	2.82	1.58	.94
Cheap	2.46	1.41	.96
Lazy	2.44	1.37	.96

Table C2.
Descriptive Statistics and Planned Contrast Results of Initial Target Attitudes

	Target 1	*Target 2*	*Target 3*	*Target 4*
Positive Attitude Toward Target	$M = 6.49$ $SD = 0.73$	$M = 6.50$ $SD = 0.71$	$M = 6.40$ $SD = 2.23$	$M = 6.47$ $SD = 0.75$
Neutral Attitude Toward Target	$M = 5.04$ $SD = 1.03$	$M = 5.12$ $SD = 1.09$	$M = 5.10$ $SD = 1.09$	$M = 5.25$ $SD = 0.95$
Negative Attitude Toward Target	$M = 1.59$ $SD = 0.83$	$M = 1.53$ $SD = 0.80$	$M = 1.60$ $SD = 0.91$	$M = 1.78$ $SD = 0.92$
Planned Contrast Result ($df = 367$)	$t = 44.38$ $p < .001$ $r_{contrast} = .92$	$t = 44.54$ $p < .001$ $r_{contrast} = .92$	$t = 40.43$ $p < .001$ $r_{contrast} = .90$	$t = 42.00$ $p < .001$ $r_{contrast} = .91$

Note. Planned contrast weights were as follows: positive (+1), neutral (0), negative (-1) initial target attitudes.

Table C3.
T-Test Results for Each Source-Trait Association

	Trait		*No Trait*				
	Mean	*SD*	*Mean*	*SD*	*t (df)*	*p*	*d*
Honest	5.39	1.23	5.32	1.11	0.53 (247)	.60	0.06
Dedicated	5.00	1.17	4.31	1.37	4.24 (247)	< .001	0.54
Intelligent	4.94	1.26	4.15	1.35	4.78 (247)	< .001	0.61
Polite	5.49	1.21	5.05	1.20	2.94 (247)	.004	0.37
Sloppy	3.05	1.41	2.16	1.25	5.20 (241)	<.001	0.67
Impatient	3.64	1.48	2.26	1.18	8.09 (241)	< .001	1.03
Cheap	2.73	1.36	2.13	1.30	3.50 (241)	.001	0.45
Lazy	2.82	1.38	2.27	1.33	3.18 (241)	.002	0.41

Note. *n* for positive traits = 127, *n* for negative traits = 121, *n* for no traits = 122.

Table C4.
Planned Contrast Weights and Results with Descriptive Statistics for Source-Trait Associations Depending on Initial Target Attitudes

	Negative	*Neutral*	*Positive*	*t(df)*	*p*	$r_{contrast}$
Hypothesis 1	-1	2	-1			
Honest	-	-	-	0.76 (124)	.23	.07
Dedicated	-	-	-	0.13 (124)	.45	.01
Intelligent	-	-	-	0.78 (124)	.22	.07
Polite	-	-	-	1.30 (124)	.10	.12
Sloppy	-	-	-	-0.71 (118)	.24	.07
Impatient	-	-	-	-0.41 (118)	.34	.04
Cheap	-	-	-	0.34 (118)	.37	.03
Lazy	-	-	-	-0.05 (118)	.48	.005
Hypothesis 2	-1	0	1			
Honest	*M* = 4.86 *SD* = 1.47	*M* = 5.50 *SD* = 1.00	*M* = 5.80 *SD* = 1.00	3.71 (124)	< .001	.32
Dedicated	*M* = 4.78 *SD* = 1.27	*M* = 5.01 *SD* = 1.25	*M* = 5.19 *SD* = 0.98	1.62 (124)	.06	.14
Intelligent	*M* = 4.64 *SD* = 1.44	*M* = 5.06 *SD* = 1.10	*M* = 5.11 *SD* = 1.18	1.73 (124)	.04	.15
Polite	*M* = 4.99 *SD* = 1.41	*M* = 5.68 *SD* = 1.05	*M* = 5.80 *SD* = 1.00	3.18 (124)	.001	.27
Sloppy	*M* = 2.86 *SD* = 1.54	*M* = 2.92 *SD* = 1.50	*M* = 3.37 *SD* = 1.16	1.63 (118)	.05	.15
Impatient	*M* = 3.38 *SD* = 1.48	*M* = 3.56 *SD* = 1.44	*M* = 3.98 *SD* = 1.48	1.86 (118)	.03	.17
Cheap	*M* = 2.50 *SD* = 1.38	*M* = 2.79 *SD* = 1.29	*M* = 2.90 *SD* = 1.40	1.31 (118)	.10	.12
Lazy	*M* = 2.41 *SD* = 1.18	*M* = 2.81 *SD* = 1.47	*M* = 3.24 *SD* = 1.37	2.76 (118)	.004	.25

Note. *M* and *SD* under Hypothesis 1 were not reported as they are same as the ones under Hypothesis 2. *P*-values are based on one-tailed tests.

Table C5.
Regression Analysis Results for Each Source-Trait Association

	B	*SE(B)*	*β*	*t*	*p*	*F*	*df*	*p*	*adj.*R^2
Honest						18.83	2, 124	< .001	.22
Constant	3.52	0.35							
Linear	0.33	0.06	.59	6.11	< .001				
Quadratic	0.09	0.03	.29	3.01	.003				
Dedicated						6.34	2, 124	.002	.08
Constant	3.88	0.33							
Linear	0.18	0.05	.34	3.42	.001				
Quadratic	0.07	0.03	.25	2.55	.01				
Intelligent						9.55	2, 124	< .001	.12
Constant	3.48	0.36							
Linear	0.24	0.06	.43	4.31	< .001				
Quadratic	0.09	0.03	.29	2.90	.004				
Polite						12.56	2, 124	< .001	.16
Constant	4.05	0.33							
Linear	0.25	0.05	.47	5.01	< .001				
Quadratic	0.07	0.03	.22	2.35	.02				
Sloppy						1.09	2, 118	.34	.001
Constant	3.20	0.44							
Linear	0.01	0.07	.02	0.19	.85				
Quadratic	-0.04	0.04	-.12	-1.18	.24				
Impatient						1.88	2, 118	.16	.01
Constant	3.19	0.43							
Linear	0.11	0.07	.17	1.67	.10				
Quadratic	-0.01	0.04	-.02	-0.16	.88				
Cheap						2.26	2, 118	.11	.02
Constant	2.75	0.40							
Linear	0.05	0.06	.08	0.82	.41				
Quadratic	-0.05	0.03	-.14	-1.38	.17				
Lazy						5.27	2, 118	.01	.07
Constant	2.93	0.41							
Linear	0.07	0.06	.10	1.08	.28				
Quadratic	-0.08	0.04	-.22	-2.16	.03				

Note. *F*-statistics and *adj.*R^2 are about the overall regression model for each source-trait association.

Table C6.
Mixed-Effects Analysis Result

Fixed effects	*Estimate*	*SE*	*F*	*df*	*p*
(Intercept)	3.52	0.46			
Linear term	0.13	0.03	19.96	1, 404.91	< .001
Quadratic term	0.004	0.02	0.05	1, 592.15	.82
Random effects	*SD*	*-2LL*	χ^2 (1)	*p*	
Traits: (Intercept)	1.17	3245.6	248.58	< .001	
Participants: (Intercept)	0.94	3335.4	338.34	< .001	
Residual	0.86				

Note. The *p*-values of fixed effects were computed based on *F*-tests using Kenward-Roger approximation for degrees of freedom (Kenward & Roger, 1997). -2 X Log-likelihood (-2LL) of the whole model based on ML criterion for model is 2997.0. Each -2LL in the table indicates the deviance value based on ML criterion when the specific random-effect parameter was removed. The lower the convergence value, the better the model fit. The number of observations is 992, the number of participants is 248, and the number of traits is 8.

Table C7.
Correlations between Message Traits and Other Traits with the Same Valence on Source-Trait Associations

Message Valence	Message Trait	Other Traits	*r*
Positive	Honest	Polite	.89***
		Intelligent	.66***
		Dedicated	.65***
	Dedicated	Honest	.54***
		Polite	.51***
		Intelligent	.61***
	Intelligent	Honest	.76***
		Polite	.66***
		Dedicated	.81***
	Polite	Honest	.71***
		Intelligent	.68***
		Dedicated	.52***
Negative	Sloppy	Impatient	.26**
		Lazy	.83***
		Cheap	.53***
	Impatient	Lazy	.62**
		Sloppy	.72***
		Cheap	.56***
	Cheap	Impatient	.33***
		Lazy	.55***
		Sloppy	.58***
	Lazy	Impatient	.23*
		Sloppy	.75***
		Cheap	.61***

Note. *n* for positive traits = 127, *n* for negative traits = 121, two-tailed, *$p < .05$ **$p < .01$ ***$p < .001$

Table C8.
Means and Standard Deviations of General Source Attitudes for Each Target Attitude Condition

	Negative Target Attitude		*Neutral Target Attitude*		*Positive Target Attitude*	
	M	*SD*	*M*	*SD*	*M*	*SD*
Source 1	4.25	1.45	4.42	1.44	4.60	1.51
Source 2	4.47	1.35	4.56	1.39	4.67	1.45
Source 3	4.00	1.45	4.51	1.43	4.53	1.49
Source 4	4.15	1.34	4.37	1.53	4.60	1.55

APPENDIX D
R SYNTAX FOR MIXED-EFFECTS ANALYSIS

```
# run the final model
# STT = source-trait association score, preatt = linear term of initial target attitudes
# preatt_quad_grand = quadratic term of initial target attitudes
# Index2 = trait index, id = participant id
library(lme4);library(pbkrtest)
m.a <- lmer(STT ~ preatt + preatt_quad_grand + (1|Index2) + (1|id), data=long.pn)
summary(m.a)
confint(m.a)

# testing the significance of fixed effects
m.a.1 <- lmer(STT ~ preatt_quad_grand + (1|Index2) + (1|id), data=long.pn)
KRmodcomp(m.a.1, m.a)
m.a.2 <- lmer(STT ~ preatt + (1|Index2) + (1|id), data=long.pn)
KRmodcomp(m.a.2, m.a)

# testing the significance of random effects
m11 <- lmer(STT ~ preatt + preatt_quad_grand + (1|id), data=long.pn)
anova(m11, m.a)
m12 <- lmer(STT ~ preatt + preatt_quad_grand + (1|Index2), data=long.pn)
anova(m12, m.a)
```

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