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Spontaneous trait inference and construal level theory: Psychological distance increases nonconscious trait thinking

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ABSTRACT

Can psychological distance affect how much perceivers form spontaneous trait inferences (STI) from others' behaviors? On the basis of construal level theory (CLT) which posits that distant (vs. near) entities are represented more in terms of their abstract, global, and decontextualized features, we predicted that perceived distance would increase the tendency for perceivers to draw spontaneous trait inferences from behavioral information about actors. In two experiments, participants learned about people who were perceived as being distant or proximal to the self, and STI formation was subsequently assessed. We found that perceivers were more likely to form STIs about distant vs. near actors from the same behavioral information. These findings generalized across two distance dimensions: space and time. In addition, we found that priming individuals to adopt a high-level (vs. low-level) construal mindset also resulted in increased STI (Experiment 3). In sum, psychological distance facilitates STI formation, and this occurs via high-level construal of actors and their behaviors.

Introduction

Imagine that you are listening to someone give a presentation, and you hear another member of the audience talking loudly to his neighbor throughout the talk. What do you think about this person? What kind of impression do you form about him? Research on spontaneous trait inferences (STIs; Winter & Uleman, 1984; see Uleman, Saribay, & Gonzalez, 2008, for a review) indicates that you will spontaneously, effortlessly, and unintentionally form the impression that the person is *rude*. Across multiple paradigms, this work has demonstrated that perceivers readily infer dispositional traits from minimal information about previously unknown individuals. However, are STIs inevitable in the face of trait-implying information about others? We suggest that this is not the case. We propose that contextual information concerning the actor's relative distance to the perceiver is crucial in determining how the perceiver will represent the actor's behaviors and that this will, in turn, affect the likelihood of STIs.

We draw on construal level theory (CLT; Trope & Liberman, 2000) for our prediction that psychological distance (vs. proximity) leads to greater STI formation. According to CLT, psychological distance is associated with a focus on the abstract, global, and superordinate features of a perceived person (i.e., high-level construal) rather than on the concrete, local, and subordinate features (i.e., low-level construal). Traits are considered to be high-level because they share the major qualities of high-level construals (e.g., abstractness and globality). Therefore, in the above case of the disruptive audience-member, you will be more likely to draw the trait inference, *rude*, if he is sitting at the opposite corner of the auditorium (i.e., is spatially distant) than if he is sitting next to you (i.e., is spatially proximal) and if he is a student at a different university (i.e., is socially distant) than if he goes to your university (i.e., is socially proximal). Following from this same premise, we also expect that directly manipulating level of construal through a mindset prime will yield the same effects, thereby pinpointing the mechanism through which psychological distance affects STI formation.

Spontaneous trait inferences from behaviors

Spontaneous trait inferences form when perceivers observe trait-implying behaviors of other people. For example, upon reading the sentence, "The secretary solved the mystery halfway through the book," people spontaneously inferred the trait, "clever" (Winter & Uleman, 1984). Various cognitive methods have been used to detect STI (see Uleman, Newman, & Moskowitz, 1996, for a review). The use of multiple paradigms, (e.g., recognition probe and cued-recall) provided converging evidence that STI exist.

Several characteristics of STI have been examined. First, the most defining characteristic of STI is that it is unintentional (Winter & Uleman, 1984). In other words, STIs do not require a conscious and explicit goal to form an impression and can form even when behavioral sentences are presented as part of a distracter task (Uleman, Newman, & Winter, 1992; Winter, Uleman, & Cunniff, 1985). A second characteristic is that STIs form during encoding of behavioral information and cannot be attributed to elaborative

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retrieval processes (Carlston & Skowronski, 1994; Uleman, Hon, Roman, & Moskowitz, 1996). Third, STIs are linked to specific actors in memory (Carlston & Skowronski, 1994; Todorov & Uleman, 2002). Lastly, STIs represent attributional knowledge about actors and reflect inferential processes rather than mere associations (Carlston & Skowronski, 2005; Crawford, Skowronski, Stiff, & Scherer, 2007). In sum, STIs represent meaningful dispositional information about particular individuals, and they do not require conscious awareness (i.e., of the process or the link between behaviors and inferences) or explicit intentions (i.e., to infer traits or dispositions) to form.

The apparent ubiquity of STIs raises the following question. Will STIs form inevitably when trait-relevant information is presented about perceived persons? We are not the first to raise this issue. In fact, past research has revealed several moderators. Some of these concern explicit processing goals and cognitive capacity. While particular goals are not necessary for STI, it can be augmented or reduced relative to when the goal is simply to memorize the person information. Uleman and Moskowitz (1994) showed that asking participants to detect isolated features in the behavioral sentences (e.g., phonemes) led to a marked reduction in STI formation. In addition, explicit questions about the veracity of information about actors at encoding can affect STI (Crawford et al., 2007). Furthermore, cognitive load affects the extent to which STIs form. Although earlier studies found that STIs do not require much cognitive capacity (Uleman et al., 1985), interference occurs with high levels of cognitive load (Uleman et al., 1992).

Other moderators concern individual and cultural differences. Individuals can differ in the extent to which they spontaneously draw trait information from others' behaviors. Personal need for structure (PNS; Neuberg & Newsom, 1993), a desire for certainty and an aversion to ambiguity, has been established as an individual difference variable that moderates STI. Moskowitz (1993) found that STIs are more likely among perceivers high (vs. low) on PNS. Furthermore, culture can affect the likelihood that perceivers form STIs. People from individualistic (e.g., European and American) and collectivistic (e.g., Asian and Latin-American) cultures differ in the extent to which they spontaneously attribute traits as causes for others' behaviors. For instance, Newman (1991) found no evidence of STIs among Puerto Rican participants. Likewise, Zarate, Uleman, and Voils (2001) used a sample of Anglo and Chicano students at the University of Texas at El Paso and showed that STIs were prevalent among Anglo but nonexistent for Chicano students. Apparently cultural differences in the importance placed on the individual (vs. the individual's relationship to his/her social environment) result in differences in how chronically one implicitly adopts a trait explanation for behaviors.

Thus, it is clear that STI effects can be moderated by explicit encoding goals or interference with the encoding process, and also by chronic individual and cultural differences that make STIs more or less likely. Therefore, our central question was, can more subtle features of the immediate social context affect STI? Considering the utility of trait inferences may help to identify meaningful contextual variables that also influence STIs. For one thing, traits represent knowledge about global behavioral tendencies. Believing that a person is *honest* involves the assumption that individual will behave in an honest manner across different situations and time. Moreover, traits have causal implications for behavior. Someone who is *honest* is expected to display a set of behaviors that are presumably elicited by virtue of the trait. Hence, trait-characterization of individuals holds more utility when forming impressions of others who are distant (e.g., in time or space) from the self. For psychologically distant actors, it is more beneficial (in terms of predictive utility) to extract the invariant features of the person's behavior that transcend the constraints of the specific situation. On the other hand, for psychologically close actors, traits have less predictive weight and direct observables, such as the specific behaviors and current situations, are more important. Thus, spontaneous trait inferences may be more prevalent when perceivers form implicit impressions of distant, rather than proximal, others.

A construal level theory analysis of STIs can potentially explain the relationship between psychological distance and STI. CLT postulates a relationship between psychological distance and the level at which objects or persons are represented, which enables us to make systematic predictions regarding the role of distance in STI formation. In accordance with CLT's central tenets, we believe that behaviors of psychologically distant (vs. close) others will be represented at a high-level of construal and thus, be more conducive to STI formation.

The role of psychological distance in person perception

Construal level theory (CLT) assumes that psychologically distant events are represented by high-level construals, and psychologically near events are represented by low-level construals. High-level construals are more abstract, decontextualized, schematic, and structured than low-level construals, which are concrete, contextualized, and incidental. When an object or event is removed from the self in the here and now, it is described as being psychologically distant. The following dimensions of psychological distance have been examined in the literature: time, space, social distance, and hypotheticality (Fujita, Henderson, Eng, Trope, & Liberman, 2006; Henderson, Fujita, Trope, & Liberman, 2006; Liviatan, Trope, & Liberman, 2008; Trope & Liberman, 2000; Wakslak, Trope, Liberman, & Alony, 2006). According to CLT, there is usually less available information about distant objects, and consequently they are represented more schematically in terms of abstract features that are invariant across different distances from the object. On the other hand, there is usually more available information about proximal objects, and consequently they are represented in more detailed and concrete ways. It is assumed that this tendency is overgeneralized so that even when information about distant and near objects is identical, the former is construed at a high-level while the latter is construed at a low-level.

Psychological distance affects social judgments. In one study, perceivers encountered a scenario from the classic Jones and Harris (1967) attitude attribution paradigm in which a writer either wrote a situationally-constrained or unconstrained essay in favor of or against an issue (Nussbaum, Trope, & Liberman, 2003, Study 1). Perceivers were then asked to make predictions about the writer's near or distant future behaviors related to the essay issue. When predicting the writer's near future behaviors, perceivers' judgments differed depending on whether the essay was constrained or unconstrained. However, when predicting the writer's distant future behaviors, perceivers' judgments did not depend on the constrained vs. unconstrained nature of the essay. Hence, the correspondence bias was more evident in the distant future condition than in the near future condition. The same effect was replicated in another study with spatial distance (Henderson et al., 2006).

According to CLT, an actor should be perceived as more cross-situationally consistent when perceived as psychologically distant. When the actor's behaviors are psychologically remote, the perceiver's construal is abstract, decontextualized, and not dependent on specific situational conditions. However, when the actor's behaviors are psychologically proximal, the perceiver's construal is more concrete and includes contextual and incidental details; therefore, the actor is seen as behaving less consistently across situations. This is what Nussbaum et al. (2003, Study 2) found. Participants were asked to imagine someone in their lives engaging in various activities either a couple days from today (near condition) vs. a few months from today (distant condition). Subsequently, they judged how the person would behave in terms of 15 personality traits in each of those situations. Perceivers judged the person to be more cross-situationally consistent in the distant future than the near future.

Global dispositional information is considered more useful for predicting distant future behaviors than near future behaviors. Participants had to predict what another person would do on the following weekend (near condition) or a weekend 3 months from today (distant condition; Nussbaum et al., 2003, Study 3). Participants who had to make distant future predictions asked more decontextualized questions ("Are you an optimist or a pessimist?") during an interview with the other person than contextualized questions ("Are you hardworking when it comes to studying?"). Apparently, perceivers consider global characteristics more important for predicting others' distant behaviors.

Perceivers also differ linguistically in how they describe others' behaviors, depending on the actors' psychological distance from the perceivers. Fujita, Henderson et al. (2006) asked participants to watch a video depicting a social scene that took place either in a classroom on NYU's Manhattan campus (spatially near condition) or in a classroom on NYU's Study Abroad campus in Florence, Italy (spatially distant condition). They then described the situation in writing. Participants' responses were coded using a coding system based on Semin and Fiedler's Linguistic Categorization Model (LCM, Semin & Fiedler, 1988). Perceivers' descriptions incorporated more adjectives (traits), the most abstract description unit in the LCM, when describing a situation that ostensibly took place in a distal vs. proximal locale. This effect was not accounted for by differences in the amount of familiarity with the location or perceived similarity to the actors.

Past research, across multiple psychological distance dimensions (e.g., temporal, spatial, and social), has shown that perceived distance affects social judgments, such as predictions about future behaviors and cross-situational consistency. Thus, this research provides a solid stepping stone for our predictions regarding psychological distance and STI formation. If dispositional information has greater weight in perceiving individuals who are psychologically distant as compared to those who are psychologically proximal, then increasing distance should have a similar effect on the tendency to form STIs. From the stance of CLT, this research will answer the question of whether perceived distance can affect implicit, unintentional processing of person information just as it affects explicit, intentional judgments. Moreover, this series of studies is the first to examine the effect of psychological distance on memory processes. Can psychological distance affect the way in which we remember and store information about others? In sum, our central aim was to demonstrate that STIs are flexibly derived based on the magnitude of felt distance between perceiver and perceived. In a series of three studies we posited that perceivers would be more likely to form STIs about distant (vs. proximal) actors, and that perceivers in a high-level (vs. low-level) construal mindset would be more likely to form STIs.

The present research

The purpose of this research was to determine whether psychological distance affects STI. Should this be the case, we also sought to examine whether manipulating level of construal directly (rather than via psychological distance) could affect STI in the same way. In Study 1, we manipulated perceivers' spatial distance from the actors. We expected perceivers to form STIs more for spatially distant actors than spatially near actors. We did not expect this effect to be mediated by differences in the degree of familiarity with the two locations or differences in perceived similarity to the actors. In Study 2, we manipulated perceivers' temporal distance from the actors, thereby testing the effect more broadly across another psychological distance dimension. We expected perceivers to form STIs more for temporally distant actors then temporally near actors, and again did not expect this effect to be mediated by differences in perceived similarity to the actors. In Study 3, we manipulated perceivers' level of construal directly by administering a mindset prime. We expected perceivers in a high-level construal mindset to form STIs more than perceivers in a low-level construal mindset.

Experiment 1

Spatial distance affects how much traits are used in describing other people's behaviors (Fujita, Henderson et al., 2006). Traits are abstract and global representations of people. Therefore, perceivers think of others' behaviors in terms of dispositional traits when those others are psychologically distant vs. psychologically near (Fujita, Henderson et al., 2006; Nussbaum et al., 2003). So manipulating spatial distance from actors should lead perceivers to form more STIs about spatially distal actors vs. spatially proximal actors, from the same behavioral information. Participants saw photographs of actors paired with one-sentence trait-implying behavioral statements about them. To manipulate spatial distance, participants were told that the actors were either: (1) NYU students studying on NYU's Manhattan campus (near condition) or (2) NYU students studying abroad in Florence, Italy (distant condition). We hypothesized that participants would form more STI about actors on NYU's Study Abroad campus in Florence, Italy, than about actors on NYU's Manhattan campus.

Method

Participants

Seventy-one undergraduate students from the department of psychology at New York University participated in the study for course credit. Participants were randomly assigned to six between-subjects conditions.

Stimuli

Forty-eight trait-implying behavioral sentences were compiled. Some were taken from Uleman (1988) verbatim and others were modified to reflect plausible behaviors of current undergraduate students. To make sure that the sentences implied the specific traits, we asked 34 students to read the behavioral sentences and indicate the trait that most easily came to mind. For each sentence, the trait word mentioned most frequently was chosen as the relevant probe. Forty-six of the 48 trait words had an overall consensus rate of 30% or greater. Two sentences had consensus rates of 15% and 18% but were still included as stimuli. All these traits were used as probes in the second part of the experiment.

We took care to choose and construct sentences that described generic behaviors that were broadly applicable for students, irrespective of location. However, to ensure that the sentences were considered equally likely for NYU students studying in Manhattan and those studying abroad in Florence, another 40 participants were asked to indicate how likely it was for an NYU student to perform each of the behaviors; half of the participants made the judgment for an NYU student in Manhattan and the other half for an NYU student in Florence. For each of the 48 sentences, participants' likelihood ratings were averaged and submitted to a t-test analysis. Results revealed that the behaviors in the sentences were considered equally likely for an NYU student in Manhattan ($M = 3.39$, $SD = .62$) and in Florence ($M = 3.24$, $SD = .63$), $t(94) = 1.21$, $p = .23$, $d = .24$.

Procedure

Study phase. All participants were told that this was a study of how individuals memorize information about other people. Participants worked individually in sound-proof cubicles, and instructions were presented on the computer. Participants were told that the experiment consisted of two parts. In the first part, they would be shown pictures of individuals with information about them, and in the second part, their memory for this information would be tested. Additionally, half of the participants were told that targets were NYU students studying in Manhattan, and the other half were told that targets were NYU students studying abroad in Florence, Italy. Participants were presented with 52 photo/behavior pairs (trials); four of the pairs were extraneous, two at the beginning and two at the end. The order of the 48 trials was randomized for each participant by the computer. The duration of each trial was 8 s, and the inter-trial delay was 2 s. During this 2 s delay, participants saw a screen with a scenic photo of Florence (or Manhattan) with a banner across the top labeled "NYU students in Florence" (or "NYU students in Manhattan") to remind participants of the distance manipulation. In 16 of the trials, the sentences contained the trait implied by the behavior. These served as filler sentences. In the remaining 32 trials, the sentences only described trait-implying behaviors. Sentences that acted as fillers were counterbalanced, forming three conditions, each with a different set of 16 photo/behavior pairs acting as fillers.

Test phase. After the 52 study trials, participants were told that in the second part, they would be tested for their memory of the photo/behavior pairs. Participants were told that they would be presented with faces from the first part of the experiment, each paired with a single trait word. Their task was to decide whether they had seen the word in the sentence about this person during the first part of the experiment. Participants pressed the key (/) labeled *old* if they believed that they had seen the word in the study phase or the key (Z) labeled *new* if they believed that they had not seen the word. Participants completed four practice trials in which feedback about the correct response was given, and continued with the test phase if they understood the instructions.

The test phase consisted of 48 trials where participants were presented with photos from the study phase paired with trait words. The trait word was placed below the photo, and each trial remained on the screen until a response was made. The next trial followed automatically. In 16 of the trials, photos presented with filler sentences during the study phase were correctly paired with traits that had been contained in the sentences earlier (filler trials). Another 16 trials consisted of photos systematically (correctly) paired with traits that were implied about those people (experimental trials), and the remaining 16 consisted of photos randomly (incorrectly) paired with traits that were implied about another person (control trials). These trial types were counterbalanced such that each photo was paired once with a trait contained in the earlier sentence, once with an implied trait systematically paired, or once with an implied trait randomly paired. The overall design was a 3 (Trial Type: filler, experimental, and control) $\times$ 3 (Counterbalancing Manipulation) $\times$ 2 (Spatial Distance: near in Manhattan vs. far in Florence) ANOVA with the first factor within subjects and the last two factors between subjects.

As part of the final questionnaire, we asked participants to rate on a scale of 1 (not very familiar) to 7 (very familiar) the degree to which they were familiar with either the Manhattan location or the Florence location, depending on which condition they were in. Participants were also asked to rate on a scale of 1 (not very similar) to 7 (very similar) the degree to which they perceived themselves to be similar to the targets. We thought that perceived familiarity with the two locations and perceived similarity to the actors might vary systematically with spatial distance. Therefore, we wanted to make sure that these variables were not confounded with spatial distance. Participants were then debriefed about the experiment and thanked for their participation.

Results and discussion

Preliminary analyses

The proportion of false recognition of implied traits was calculated for experimental and control trials for each participant. For filler trials, the proportion of correct recognition was calculated.

Correct recognition of traits that had actually been presented with the photo during the study phase was .74 (SD = .16). This significantly exceeded the chance level of .50, $t(70) = 12.30$, $p < .001$, $d = 1.50$. More importantly, false recognition of traits was greater on the experimental trials where traits and photos were systematically paired (M = .26, SD = .18) than on control trials where they were randomly paired (M = .12, SD = .11), $t(70) = 6.96$, $p < .001$, d = .83. This is evidence that spontaneous trait inferences had been formed (Todorov & Uleman, 2002).

Effect of spatial distance on spontaneous trait inferences

A summary false recognition score was computed for each participant by subtracting the rate of false recognition on the control trials from the rate of false recognition on the experimental trials.[1] The dependent variable in the following analyses was this false recognition difference score. A 2 (Spatial Distance: Manhattan vs. Florence) $\times$ 3 (Counterbalancing Manipulation) ANOVA with both factors between subjects revealed a significant effect of spatial distance on false recognition of traits. Participants in the spatially distant condition (M = .18, SD = .20) evidenced greater false recognition of traits than those in the spatially near condition (M = .10, SD = .11), $F(1, 65) = 5.06$, $p < .05$, $\eta_p^2 = .07$ (see Fig. 1, left panel). There was also a significant main effect of the counterbalancing manipulation, $F(2, 65) = 7.71$, $p = .001$, $\eta_p^2 = .19$. However, this factor did not significantly interact with the critical spatial distance variable, and therefore is not discussed further.

One alternative explanation for the results could be differential familiarity with the locations in the two spatial distance conditions. To test this explanation, participants indicated how familiar they were with Manhattan (Florence) in the spatially near (distant) condition. Indeed, participants were significantly more familiar with the New York location (M = 5.35, SD = 1.56) than the Florence, Italy location (M = 2.65, SD = 1.98), $t(69) = 6.24$, $p < .001$, $d = 1.51$. However, familiarity was not significant when entered as a covariate, $F(1, 68) < 1$, p = ns, $\eta_p^2 = .01$, and the main effect of spatial distance on false recognition remained significant, $F(1, 68) = 4.31$, $p < .05$, $\eta_p^2 = .06$. Therefore, differential familiarity with the New York and Florence locations could not account for the difference in false recognition of traits.

A difference in perceived similarity between the participants and distant vs. near targets might also provide an alternative explanation. We did not expect a significant difference since all targets were presented as NYU students. As expected, participants did not differ in their perceived similarity to the spatially distant (M = 3.93, SD = 1.12) vs. spatially near (M = 3.71, SD = 1.07) targets, $t(69) < 1$, p = ns, d = .20.

[1] For all three studies, difference scores are reported for their theoretical relevance, comparability with prior research using this paradigm, and clarity. However, we wanted to verify that the effect of distance on STI was driven by differences in false recognition on experimental trials rather than control trials. Pairwise comparisons from a repeated-measures ANOVA with false recognition rates on the experimental and control trials as dependent variables are reported. As expected, false recognition rates on control trials were comparable in the spatially distant (M = .11, SD =.10) and spatially near (M = .13, SD = .12) conditions, $t(50) < 1$, p = ns. On the other hand, there was a marginally significant difference in false recognition rates on experimental trials in the spatially distant (M = .29, SD = .19) vs. spatially near (M = .22, SD = .16) conditions, $t(69) = 1.77$, p =.08, $\eta_p^2 = .046$. This shows that the effect of spatial distance on STI formation was due to differences in false recognition rate of implied and systematically rather than randomly paired traits.

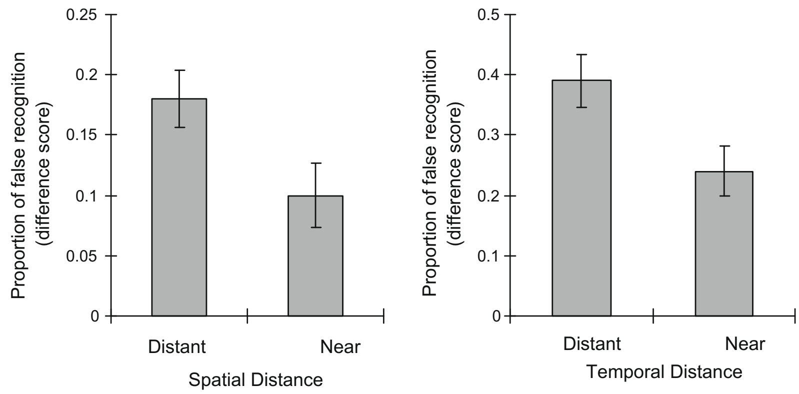

Fig. 1. False recognition (difference score) as a function of spatial distance (Experiment 1) and temporal distance (Experiment 2).

Study 1 provides evidence that perceivers form more STIs for spatially distal actors than spatially proximal actors. Apparently perceivers are more likely to implicitly think about others' behaviors in terms of internal dispositions when those others are in a distant location. All actors were presented as NYU students to make sure that social distance was not confounded with the spatial distance variable. Furthermore, the effect of spatial distance on STI could not be attributed to differences in the level of familiarity with the two locations or perceived similarity to the actors. Although participants were more familiar with the Manhattan location than the Florence location, this variable did not mediate the relationship between spatial distance and STI formation. Additionally, spatial distance did not affect how similar perceivers felt to the actors.

Experiment 2

Results from Study 1 indicated that spatial distance from actors increases the tendency for perceivers to form spontaneous trait inferences. In Study 2, we sought to replicate this effect with another dimension of distance, time. By doing so, we hoped to broaden the implications of Study 1 and to make the claim that psychological distance, in general, and not spatial distance in particular, results in increased STI. Perceivers have been shown to display more correspondence bias for actors' distant future (vs. near future) behaviors. Furthermore, perceivers believe actors' distant future behaviors will be more cross-situationally consistent and better predicted by global information than actors' near future behaviors (Nussbaum et al., 2003). Similar to spatial distance, manipulating temporal distance from actors should lead perceivers to form more STI about temporally distal (vs. proximal) actors from the same behavioral information. Participants were shown photographs of various actors paired with one-sentence behavioral statements about them. To manipulate temporal distance, participants were told either that the actors were: (1) NYU students from the year 2007 (recent past) or (2) NYU students from the year 1997 (distant past). STI formation was measured subsequently. We hypothesized that participants would form more STIs about NYU students from the distant past, 1997, than about NYU students from the recent past, 2007.

Method

Participants

Fifty-six undergraduate students from the department of psychology at New York University participated in the study for course credit. Participants were randomly assigned to six between-subjects conditions.

Stimuli

Based on final questionnaire data which suggested that participants felt that Study 1 was too long, the stimulus set was reduced from 48 to 36 pairs, to maximize participant engagement. All 36 behavioral sentences implied traits. All 36 traits had a consensus rate of 30% or greater on an earlier pretest.

As described earlier, these behavioral sentences described generic behaviors that were broadly applicable for students, irrespective of time. However, to ensure that the sentences were considered equally likely for NYU students from 1997 and 2007, another 30 participants were asked to indicate how likely it was for an NYU student to perform each of the behaviors; half of the participants made the judgment for an NYU student in 1997 and the other half for an NYU student in 2007. For each of the 36 sentences, participants' likelihood ratings were averaged and submitted to a *t*-test analysis. Results revealed that the behaviors in the sentences were considered equally likely for an NYU student in 1997 ($M = 3.41$, $SD = .56$) and in 2007 ($M = 3.43$, $SD = .71$), $t(70) < 1$, p = ns, $d = .03$.

Procedure

Study phase. The study phase was the same as in Study 1 except for the distance manipulation and the reduction in the number of trials. Half of the participants were told that targets were NYU students from the year 1997, and the other half of the participants were told that targets were NYU students from the year 2007. Instead of 52 trials, there were 40 trials in the study phase, including two extra trials in the beginning and two at the end. During the 2 s delay between trials, participants saw a screen with a photo of NYU campus with a banner across the top labeled "NYU students in 1997" (or "NYU students in 2007"); this served as a reminder about the temporal distance manipulation.

Test phase. The test phase was the same as in Study 1 except for the reduction in the number of trials. Instead of 48 trials, there were 36 trials in which photo/trait pairs were presented. The overall design was a 3 (Trial Type: filler, experimental, and control) × 3 (Counterbalancing Manipulation) × 2 (Temporal Distance: 1997 vs. 2007) ANOVA with the first factor within subjects and the last two factors between subjects.

As part of the final questionnaire, we asked participants to rate on a scale of 1 (not very similar) to 7 (very similar) the degree to which they perceived themselves to be similar to the targets. As in Study 1, we wanted to ensure that perceived similarity to the distant and near actors was not confounded with temporal distance. Perceived familiarity was not relevant here so it was not measured. Participants were then debriefed about the experiment and thanked for their participation.

Results and discussion

Evidence for spontaneous trait inference formation

As in Study 1, correct recognition of traits that had actually been presented with the photo during study phase significantly exceeded the chance level of .50 (M = .79, SD = .14), $t(55)$ = 14.96, p < .001, d = 2.07. Participants were also more likely to falsely recognize traits on the experimental trials (M = .41, SD = .25) than on the control trials (M = .10, SD = .13), $t(55)$ = 10.07, p < .001, d = 1.34, thereby indicating that spontaneous trait inferences had been made (Todorov & Uleman, 2002).

Effect of temporal distance on spontaneous trait inferences

As in Study 1, a summary false recognition score was computed for each participant and was used as the dependent variable in subsequent analyses.[2] Consistent with predictions, a 2 (Temporal Distance: 1997 vs. 2007) $\times$ 3 (Counterbalancing Manipulation) ANOVA with both factors between subjects revealed a significant effect of temporal distance on false recognition of traits. Participants in the temporally distant condition (M = .39, SD = .24) evidenced greater false recognition of traits than those in the temporally near condition (M = .24, SD = .20), $F(1, 50)$ =5.28, p < .05, η_p^2 = .10 (see Fig. 1, right panel). No other effects were statistically significant.

We tested for the possibility that the effect of temporal distance on STI could be a difference in perceived similarity between participants and temporally distant vs. near targets. However, similar to Study 1, participants did not differ in their perceived similarity to temporally distant (M = 3.96, SD = 1.28) vs. temporally near (M = 3.77, SD = 1.22) targets, $t(54)$ < 1, p = ns, d = .15.

Study 2 corroborated the results from Study 1. Like spatial distance, temporal distance from actors increased STI formation. The more temporally removed the actor was from the perceiver, the more predisposed the perceiver was to construe the actor's behavior at a high-level and form trait inferences from the information given. This occurred even though behavioral information about distant and near actors was exactly the same. Studies 1 and 2 provide converging evidence that psychological distance from actors leads to high-level construal of their behaviors, thereby increasing spontaneous trait inference formation.

Experiment 3

In this study, our aim was to demonstrate that the mechanism underlying the effect of psychological distance on STI formation was differential construal of distant and near actors. We reasoned that if construal level mediates the relationship between psychological distance and STI formation, directly manipulating level of construal should influence trait inferences in the same way. Recently, it was argued that this method of determining the underlying psychological process is as reliable as using the statistical mediation analysis developed by Baron and Kenny (1986) (Spencer, Zanna, & Fong, 2008). In this experiment, participants were induced via a mindset prime to adopt either a high-level or a low-level construal mindset. For a given set of objects (e.g., car), participants were asked to either generate a superordinate category (e.g., vehicle) to which the object belonged, or an exemplar (e.g., Chevy) of the object. Generating categories has been shown to induce a high-level construal mindset while generating exemplars induces a low-level construal mindset (Fujita, Trope, Liberman, & Levin-Sagi, 2006, Study 3). After the mindset prime, participants were exposed to information about actors, and STI formation was measured in a subsequent task. We hypothesized that participants in a high-level mindset would form STI to a greater extent than participants in a low-level mindset.

Method

Participants

Forty-three undergraduate students from the department of psychology at New York University participated in the study for course credit. Participants were randomly assigned to two between-subjects conditions.

Stimuli

The same 36 photographs and behavioral sentences from Study 2 were used in this study. Since the counterbalancing manipulation did not interact with the spatial distance variable in Study 1 and had no effect on the results in Study 2, it was eliminated as a factor in Study 3.

Procedure

Mindset prime. Participants were told that they would complete a short word generation task. Participants were provided with a series of 40 words, and in the high-level construal condition, their task was to determine a category that the provided word was an example of. They were told to ask themselves the question, ‘‘[Provided word] is an example of what?" and to try to come up with the most general word for which the provided word was an example. For instance, for the provided word, ‘‘dog," participants might write down, ‘‘mammal". Two practice trials were completed before beginning the actual task. In the low-level construal condition, participants' task was to write a word that was an example of each of the same series of provided words. They were told to ask themselves the question, ‘‘An example of [provided word] is what?" and to come up with as specific an example of the provided word as possible. For instance, for the provided word, ‘‘dog," participants might write down, ‘‘poodle". Two practice trials were completed before beginning the actual task.

Study phase. The study phase was the same as in Study 2 except that a blank screen was presented during the 2 s delay between trials. In Studies 1 and 2, a screen reminding participants of the distance manipulation had been presented.

Test phase. The test phase was the same as in Study 2. The overall design was a 3 (Trial Type: filler, experimental, and control) $\times$ 2 (Level of Construal: high vs. low) ANOVA with the first factor within subjects and the second factor between subjects.

As part of the final questionnaire we asked participants to rate their mood on a scale of 1 (very negative) to 7 (very positive). Previous research has shown that positive mood is associated with global processing of information (Gasper & Clore, 2002). Therefore, we wanted to check whether there were systematic differences in mood as a function of level of construal, and if so, to enter it in a covariate analysis to isolate the effect of construal level on STI formation. Participants were then debriefed about the experiment and thanked for their participation.

Results and discussion

Evidence for spontaneous trait inference formation

Consistent with Studies 1 and 2, correct recognition of traits on the filler trials was high and significantly above chance level (M = .79, SD = .12), $t(42)$ = 15.20, p < .001, d = 2.32. Confirming that

[2] As in Study 1, there was no difference in false recognition rates on control trials across the two temporal distance conditions (‘‘1997," M = .096, SD = .10; ‘‘2007," M = .11, SD = .15), $t(54)$ < 1, p = ns, η_p^2 = .001. However, there was a marginally significant difference in false recognition rates on experimental trials in the spatially distant (M = .48, SD = .24) vs. spatially near (M = .35, SD = .25) conditions, $t(54)$ = 1.92, p = .06, η_p^2 = .069.

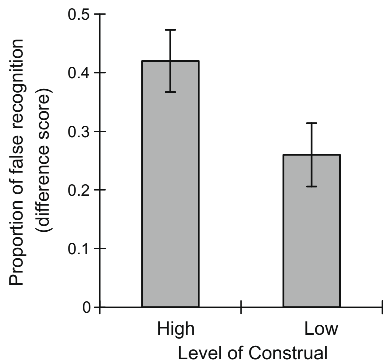

Fig. 2. False recognition (difference score) as a function of level of construal in Experiment 3.

spontaneous trait inferences had been made, participants were again more likely to falsely recognize traits on the experimental trials ($M = .47$, $SD = .24$) than on the control trials ($M = .12$, $SD = .13$), $t(42) = 8.78$, $p < .001$, $d = 1.34$.

Effect of construal on spontaneous trait inferences

As in Studies 1 and 2, all analyses were conducted using the false recognition difference score as a dependent variable.[3] As predicted, construal level had a significant effect on false recognition of traits; participants in a high-level construal mindset ($M = .42$, $SD = .27$) had higher false recognition rates than those in the low-level construal mindset condition ($M = .26$, $SD = .22$), $t(41) = 2.15$, $p < .05$, $d = .66$ (see Fig. 2).

One alternative explanation for the results could be a difference in mood between participants in the high- vs. low-level construal conditions. Perhaps doing one task puts perceivers in a better mood than doing the other. At the end of the experiment, we asked participants, "How positive or negative do you feel right now?" and asked them to make a judgment on a scale of 1 (very negative) to 7 (very positive). As expected, perceivers in the high-level ($M = 4.36$, $SD = .95$) and low-level ($M = 4.43$, $SD = .51$) construal mindset conditions did not differ in perceived mood, $t(41) < 1$, p = ns, $d = .09$.

Manipulating construal level directly influenced STI in the same way as psychological distance. Specifically, individuals induced to adopt a high-level construal mindset formed more STIs than those in a low-level construal mindset. This effect could not be accounted for by differential mood in high- and low-level construal mindsets; self-reported mood did not vary as a function of the mindset prime. This study is the first to demonstrate the direct effect of construal on person perception processes, whether intentional or spontaneous. The finding that construal level affects STI formation supplements the argument in Studies 1 and 2 and provides evidence that psychological distance affects STI via differences in levels of representation of distant and near actors. Distant actors, as compared to proximal actors, are represented at higher levels of construal, and therefore elicit more STI even when behavioral information is held constant.

General discussion

In two studies, we tested the hypothesis that greater psychological distance leads to greater spontaneous trait inference formation. This hypothesis was derived from construal level theory, which states that psychologically distant (vs. proximal) actors are represented in terms of their high-level (e.g., abstract, global, decontextualized) features, such as their traits. In Study 1, we found that participants led to believe that actors were in a distant location (Florence, Italy), as compared to a proximal location (Manhattan), formed more STIs, even though behavioral information about targets was the same across the two conditions. In Study 2, we found the same effect using temporal distance. Participants led to believe that actors were from the distant past (year 1997), as compared to the recent past (year 2007), formed more STI. In a third study, we tested the mechanism underlying the relationship between psychological distance and trait inferences directly by experimentally manipulating level of construal via a mindset prime and found the same effect. Specifically, participants induced to be in a high-level construal mindset, as compared to those in a low-level construal mindset, evidenced greater STI formation. Consistent with CLT, these results suggest that individuals are more likely to spontaneously represent others in terms of their traits when those others are perceived as psychologically distant rather than proximal. Results from Study 3 implicate the levels of construal at which individuals are represented as the mechanism driving the effect of psychological distance on STI formation.

Implications for perceiving near and distant people

The current findings shed light on the conditions under which individuals may be more or less likely to implicitly represent others in terms of their traits. Perceived distance from targets, both spatial and temporal, facilitated the readiness with which STIs were generated from targets' behaviors. Apparently a feeling of distance induces individuals to think at a high-level and thus draw more trait inferences, even at an implicit stage of information processing. Studies 1 and 2 found converging evidence across two types of distance dimensions: space and time. These results imply that psychological distance, in general, leads to greater STI formation and not just spatial or temporal distance, in particular. Similar effects should be obtained with other dimensions of psychological distance, such as social distance or hypotheticality. For instance, people should form STIs more from behaviors of socially distant others (e.g., one's classmate) than socially proximal others (e.g., one's roommate), irrespective of degree of familiarity, similarity, or identification with those others.

Our studies are the first to examine the effect of actor-relevant contextual information on STI formation. Thus far, moderators such as processing goals and cognitive load have been found to influence STI. These variables affect STI by altering information processing goals or by interfering with the process of forming STIs. In the present studies, differences in STI formation resulted from mindset differences in how distant and near actors are implicitly represented.

The present work suggests that the effect of psychological distance on explicit social judgments (Henderson et al., 2006; Nussbaum et al., 2003) may be built on an initial spontaneous trait inference. For example, the correspondence bias occurred when perceivers predicted targets' distant future, but not near future, behaviors (Nussbaum et al., 2003, Study 1) and when making predictions about spatially distant, but not proximal, targets (Henderson et al., 2006). In light of the present findings, it seems possible that perceivers initially formed more STI for distant than proximal targets and evidenced increased correspondence bias as a downstream effect of increased STI formation. Similarly, perceivers may view distant others as more cross-situationally consistent (Nussbaum et al., 2003, Study 2) because these explicit impressions are based on initial, spontaneous trait inferences that individuals generate at the implicit level. Future research should include

[3] As in Studies 1 and 2, there were no differences in false recognition rates on control trials across the two construal-level conditions (high-level, $M = .11$, $SD = .12$; low-level, $M = .14$, $SD = .14$), $t(41) < 1$, p = ns, $\eta_p^2 = .02$. However, there was a marginally significant difference in false recognition rates on experimental trials in the high-level ($M = .53$, $SD = .24$) vs. low-level ($M = .40$, $SD = .22$) construal mindset conditions, $t(41) = 1.79$, $p = .08$, $\eta_p^2 = .072$.

both implicit and explicit measures of impressions, and examine possible mediation of explicit effects.

These results also extend findings that show differences in the abstractness with which behaviors of distant vs. proximal others are described (Fujita, Henderson et al., 2006). After observing an interaction between targets in a spatially distant (vs. proximal) location, perceivers' written descriptions of the interaction incorporated more traits words, which are the most abstract unit of language in describing others (Semin & Fiedler, 1988). The present findings demonstrate that representations of distant and near others diverge on more than just the linguistic signatures associated with each representation. Rather, traits, as concepts and perhaps causal explanations for behaviors, are more readily inferred spontaneously and nonconsciously upon initial observation of distant behaviors.

The finding that psychological distance induces high level construal and increases STIs may partially explain cultural differences in STI formation. Previous research demonstrated that STIs are less prevalent in collectivistic cultures (e.g., Latino) than in individualistic cultures (e.g., Euro-American; Newman, 1991; Zarate et al., 2001). This was consistent with findings that Euro-Americans (from individualistic cultures) tend to emphasize internal causes to explain others' behavior, while East-Asians (from collectivistic cultures) place more weight on situational factors (Nisbett, 2003; Nisbett, Peng, Choi, & Norenzayan, 2001). In addition to differing attribution styles, European–Americans and East-Asians differ in basic perceptual processes. Across several studies using various methodology, individuals from collectivistic cultures were shown to focus more on contextual information and to have more field dependence on perceptual tasks, such as the Rod-and-Frame Test (Ji, Peng, & Nisbett, 2000), than those from individualistic cultures (Abel & Hsu, 1949; Kitayama, Duffy, Kawamura, & Larsen, 2003; Masuda & Nisbett, 2001).

Furthermore, Markus and Kitayama (1991) described individualistic and collectivistic cultures as having different styles of self-construal. Individuals from context-centered cultures possess interdependent self-construals, characterized by the belief that others are included within the boundaries of the self and are fundamentally related to the self; those from person-centered cultures possess independent self-construals, which are characterized by a devaluation of connectedness between individuals, a desire to maintain autonomy, and the belief that the self is a complete and separate entity. According to this conceptualization, individuals from individualistic cultures may generate STIs more from behaviors as compared to those from collectivistic cultures because they experience greater chronic psychological distance from others. On the other hand, individuals from collectivistic cultures may form STIs less because they experience less chronic psychological distance from others, and therefore form more contextualized representations of them. Future research should examine the relationship between cultural differences and psychological distance more systematically.

Our findings may also shed light on the function of trait inferences. When others are distant, it benefits perceivers to extract what is invariant about those others because low-level aspects (i.e., specific behaviors, situational context) are more likely to change. For instance, it benefits the perceiver to draw the trait inference, "honest," from an actor's distant past behavior, "He told his roommate that he broke their expensive TV during the party," because the details of the actor's actions may change over time. By retaining the trait implication of the actor's behavior, the perceiver can extrapolate and make predictions about the actor's future behavior. On the other hand, it benefits the perceiver to retain information about the behavior itself when that behavior is from the actor's recent past because this specific information is a reliable basis for predictions about the actor. Trait inferences are functional for psychologically distant actors because they allow perceivers to transcend the constraints of the specific context and inform predictions about the actors when details of the situation may no longer be relevant.

Potential alternative explanations and limitations

A potential alternative explanation for our finding in Study 1 was differential familiarity with the distant and near locations of the targets. Participants were NYU undergraduates so they were more familiar with Manhattan than with Florence, Italy. Furthermore, though we took care to make sure participants did not identify with one group of targets more than the other by having all targets be NYU students, perceivers may still have felt more similar to targets who were described as NYU students on NYU's Manhattan campus (near condition) than those described as NYU students on NYU's Study Abroad campus in Florence, Italy (distant condition). Thus, differential similarity could also potentially explain our effect. Indeed, Idson and Mischel (2001) found that individuals use fewer traits and more cognitive-affective units (e.g., feelings, thoughts, goals, beliefs, etc.) to describe targets when the targets were better known (i.e., more familiar and possibly perceived as more similar). But our analyses indicated that these variables were not responsible for our effects. Neither familiarity (Study 1) nor similarity (Studies 1 and 2) could account for the effect of psychological distance on STI.

The false recognition paradigm employed in the current studies uses the rate of recognition errors to assess STI formation. Hence, the more errors participants make by falsely recognizing a previously implied trait as having been in the sentence earlier, the more STIs they are said to have formed. Is it possible that when actors are spatially or temporally distant, perceivers are simply less involved and attentive which consequently leads to more errors on the false recognition task (i.e., more STIs)? We contend that this alternative explanation is not valid based on our finding that perceivers who learned about distant actors did not make more errors, overall, but more of a particular kind of error. They were more likely (than perceivers in the near condition) to falsely recognize previously implied traits as having been present in the sentences earlier; however, there were no differences in correct recognition of traits that had been in the sentences earlier or in false recognition of implied traits randomly paired with the wrong actors as a function of psychological distance. Therefore, reduced effort cannot explain the distance-dependent differences in STI formation that we observed in Studies 1 and 2.

One limitation of these studies is that only one paradigm, the false recognition paradigm, was used to detect STI formation. It is possible that this procedure is not ideally suited to study trait inferences made at encoding since STIs are not assessed online. As such, we cannot completely discount the possibility that the effects observed are a result of retrieval processes rather than inferences made at encoding. However, as mentioned in the introduction, a number of paradigms have been validated and used to study STI effects, including cued recall (Winter & Uleman, 1984), probe recognition (Uleman et al., 1996), false recognition (Todorov & Uleman, 2002), savings-in-relearning (Carlston & Skowronski, 1994), and lexical decision (Zarate et al., 2001). Noteworthy is the fact that the savings-in-relearning paradigm, in particular, has been used to demonstrate that STI effects are uncorrelated with explicit recall of behaviors (Carlston & Skowronski, 1994). The convergence among these paradigms gives us confidence that the effects obtained in the current studies using the false recognition paradigm are reliable.

Could the STI effects observed in the present studies reflect inferences about the behaviors, rather than inferences about the actors, which then become associated with the actors? For instance, Brown and Bassili (2002) found that spontaneous associations can form between traits and inanimate objects when those objects are presented with behavioral sentences implying traits. They argued that this is evidence that the effects underlying STI may not necessarily reflect inferential processes. Moreover, Carlston, Skowronski, and their colleagues found that traits can become attached to communicators who simply describe the trait-implying behaviors of someone else; this phenomenon has been called spontaneous trait transference (STT; Carlston, Skowronski, & Sparks, 1995; Skowronski, Carlston, Mae, & Crawford, 1998). If traits can be inferred and then attached to entities (e.g., inanimate objects, communicators) other than the actors, might the inferences we observed reflect such associations? We believe this to be untenable for several reasons. First, the false recognition paradigm ensures that trait inferences formed are attached to the specific actors themselves; STI formation is evidenced when the rate of false recognition is greater on the experimental trials where traits are correctly paired with the corresponding actors than on control trials where traits are randomly paired with other familiar actors. Second, we know from Todorov and Uleman (2004) that STIs are selectively attached to actors' faces and not to faces concurrently presented with the actors at encoding. Recently, Goren and Todorov (2009) provided additional evidence that the false recognition paradigm can be used to detect trait inferences about the actors (STIs) and trait associations to communicators (STT). In one study, they found that individuals formed STIs significantly more from behaviors that were relevant to (i.e., performed by) the actors as compared to behaviors that were irrelevant to (i.e., not performed by) the actors. In all three of the present studies, the overall STI effects, operationalized as the comparison between false recognition rates on experimental vs. control trials, are highly significant ($ps < .001$) and are more comparable to the STI (not STT) effects found in Goren and Todorov (2009). Therefore, we can be reasonably certain that the effects observed here reflect trait inferences about the actors rather than mere associations to them.

Another possible limitation of this study is the lack of a baseline for STI formation. We did not have a control condition where distance was not manipulated at all. Therefore, we only know that distance leads to more STIs relative to proximity, and cannot confirm whether greater distance increases STIs, proximity decreases it, or both. On the other hand, what would constitute a control condition for psychological distance is entirely unclear because it is impossible to define a state of zero distance for any entity other than the self. Any object, event, or person can be said to maintain some degree of psychological distance from the self. Nevertheless, including a no-distance condition would have allowed us to examine what the default degree of psychological distance is for participants in STI studies where no such information is given about targets. Our data indicate that false recognition rates in the distant condition are more comparable to those from previous STI studies with similar numbers of stimuli and timing (e.g., Todorov & Uleman, 2002). So perhaps when no distance information is given, perceivers feel relatively distant from targets, and giving additional proximity information decreases STI.

Conclusion

We found that psychological distance facilitates the formation of spontaneous trait inferences from others' behaviors. This occurred even though behavioral information was identical for both distant and near actors. In addition, we demonstrated that manipulating the level of construal via a mindset prime led to similar effects – high-level construal, which corresponds to processing of psychologically distant entities, led to increased STI formation as compared to low-level construal. We conclude that psychological distance affects the structure of person representations at an implicit level. When others are distant from (vs. close to) the self, their actions and natures are implicitly construed more abstractly, in terms of dispositional traits.

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