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RESEARCH ARTICLE

Are Past and Future Selves Perceived Differently from Present Self? Replication and Extension of Pronin and Ross (2006) Temporal Differences in Trait Self-Ascription

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We attempted a pre-registered replication and extension of Studies 1, 2, and 3 from Pronin and Ross (2006) regarding the effects of social and temporal distance on trait attributions with an online American Amazon MTurk sample ($N = 911$). We concluded mixed findings. We found support for the original findings: participants attributed more dispositional traits to others compared to themselves, although with weaker effects (original: $f = 0.35$, 95% CI [0.09, 0.61]; replication: $f = 0.10$, 95% CI [0.03, 0.16]). Also, similar to the original, we found that participants tended to attribute a favorable ratio of positive traits when making self-assessments (original: $f = 0.77$, 95% CI [0.29, 1.25]; replication: $f = 0.88$, 95% CI [0.50, 1.26]). However, unlike the original, we failed to find support for the core hypothesis that participants would ascribe more dispositional traits to their temporally distant self compared to their present self (original: $f = 0.54$, 95% CI [0.27, 0.77]; replication: $f = 0.02$, 95% CI [0.00, 0.06]). Furthermore, in contrast to the original, we found that the positive traits ratio increases with temporal distance (original: $f = 0.16$, 95% CI [0.00, 0.36]; replication: $f = 0.33$, 95% CI [0.22, 0.42] in the opposite direction). Contrary to our hypothesis, in an extension, we found that people were more likely to ascribe a greater ratio of positive traits to their friends than to themselves ($\xi = 0.3$, 95% CI [0.21, 0.38]). All materials, data, and code are provided here: https://osf.io/gs2rx/.

Keywords: temporal asymmetry; temporal distance; bias; judgment and decision making; psychological distance; actor-observer asymmetry; trait ascriptions

Introduction

We see ourselves differently than how we see others (Pronin, 2008). This is partly related to our limited ability to read others' minds. We have access to our internal thoughts and feelings, yet we can only make assessments about other people based on their observable behaviors. An example of this process is a phenomenon psychologists refer to as the *actor-observer asymmetry in attribution* (Jones & Nisbett, 1971), wherein people are more likely to make dispositional attributions when assessing others but make situational inferences when assessing themselves.

Expanding on this, Pronin and Ross (2006) posited that a similar asymmetry applies to the judgments we make about our temporally distant self. Unlike the assessments we make about ourselves in the present, how we judge our past and future self is more akin to the way we judge others. By asking participants to make trait assessments about their friends versus themselves in either the past or present (Study 1), their present or future selves (Study 2), and their past, present, or future selves (Study 3), Pronin and Ross (2006) were able to demonstrate that the trait assessments we make about our temporally distant selves more closely resemble those we make about other people's traits than those we typically make about ourselves. Importantly, these findings were later linked with reasons for why people often make poor long-term choices (e.g., Ersner-Hershfield, Wimmer, & Knutson, 2009; Jones, Hine, & Marks, 2017). As Pronin and Ross (2006) would argue, it may be because we see our temporally distant self 'as an other'.

In light of the academic impact and practical implications of Pronin and Ross (2006), we sought to conduct a very close replication of their studies with two clear goals. The first goal was to conduct an independent close replication of the temporal asymmetry phenomenon. The second goal was to examine an extension regarding the effect of self-serving bias on trait self-ascriptions.

We begin by introducing the literature on psychological distance as it relates to the phenomena of actor-observer

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asymmetry and temporal asymmetry in trait ascriptions. Following that, we introduce the target article, Pronin and Ross (2006), highlighting motivation for the current replication study and providing an overview of the scope of the replication. We then summarize the original hypotheses and the findings by Pronin and Ross (2006) and suggest an extension examining self-serving bias.

Psychological Distance

Psychological distance refers to the subjective perceived distance of how far away or, conversely, how close something is in regard to its social, temporal, spatial, or hypothetical proximity from the self in the present moment (Liberman et al., 2007; Trope & Liberman, 2010). Although we are only able to directly experience the present moment, construal level theory (CLT; Trope & Liberman, 2010) postulates that we are able to transcend the present moment and traverse psychological distances by creating abstract mental construals of psychologically distant objects. It is through this process of creating mental construals that people are able to do things like reminisce about the past (temporal distance), plan for the future (temporal distance), and empathize with points of view other than one's own (social distance) despite those being outside the bounds of their direct experience. Since these different kinds of psychological distances all operate with the self as the reference point, Trope and Liberman (2010) suggested that they operate using similar cognitive mechanisms and thus have similar effects on perception and action. Since Pronin and Ross (2006) investigated the comparable effect of temporal distance and social distance on trait ascriptions, we will be focusing on these facets of psychological distance for the present discussion.

According to CLT, the more psychologically distant an object is from the self, the more abstract the construal becomes. Meaning, higher-level construals of more distant objects tend to be more abstract and general (e.g., excel in academics), whereas lower-level construals of less distant objects are more concrete and detailed (e.g., read a textbook). These construals go on to affect one's judgment or perception of said object. For example, studies have found that people make increasingly dispositional attributions, as opposed to situational attributions, about other actors' behaviors as temporal distance increases (e.g., Funder & Van Ness, 1983). This is because higher-level construals promote the tendency to interpret distant behaviors in terms of decontextualized and abstract dispositions rather than concrete, situational factors (Trope & Liberman, 2010). As will be elaborated in the following paragraphs, this can affect practical processes such as moral judgment (e.g., Agerström & Björklund, 2009; Mårtensson, 2017) and risk-taking behaviors (e.g., Hershfield & Kramer, 2017; Raue et al., 2015).

Social Distance: Actor-Observer Asymmetry in Trait Assessments

The actor-observer asymmetry refers to the observed difference in the type of assessments we make regarding other people compared to those we make of ourselves. Whereas people often make dispositional attributions for the actions that other people make (e.g., 'She did not give up her seat for the elderly lady on the train because she is rude.'), they often resist doing so for their own actions, instead attributing them to situational factors (e.g., 'I did not give up my seat for the elderly lady because of my sprained ankle.'). In their seminal paper regarding actor-observer asymmetry, Jones and Nisbett (1971) argued that this phenomenon results from a difference in the information available to the actors versus those available to the observers. Although we are aware of the situational constraints influencing our own behavior (e.g., a sprained ankle), this information is not as salient to observers. Thus, in the absence of available information, observers attribute the behaviors of other actors to their disposition. Similarly, according to CLT, this is because other people are more psychologically distant than the self and therefore construed on a higher-level. Hence, when making judgments about a temporally distant self, we tend to focus on superordinate, dispositional traits rather than subordinate, situational explanations.

Temporal Distance: Temporal Asymmetry in Trait Assessments About the Self

A similar asymmetry in trait ascriptions can also be observed when comparing assessments made of the present self versus those made of temporally distant selves. As Pronin and Ross (2006) found, participants were more inclined to attribute dispositional traits, and less inclined to make ascriptions to situational variability, to their past or future self compared to their present self. This may be because temporal distance changes people's mental representations of themself (Trope & Liberman, 2003). More specifically, the greater the temporal distance, the more abstract the mental construal becomes, focusing on the perceived essence of their identity (e.g., personality) rather than specific details (e.g., situational constraints). As a result, people ascribe a greater number of dispositional traits to their temporally distant selves compared to their present self.

The theories and studies discussed thus far relate closely to Pronin and Ross's (2006) study, in which they extended upon the existing literature by positing that the temporal asymmetry in trait self-ascriptions closely mirrors the classic actor-observer asymmetry in trait ascriptions. Participants are more likely to ascribe dispositional traits, instead of situational ascriptions, to others compared to themselves. Similarly, participants are also more inclined to ascribe dispositional traits to their past and future selves compared to their present self. As previously discussed, this is because increases in both temporal and social distance cause higher-level construals. Thus, they may have comparable effects, possibly with similar underlying mechanisms. In this way, they argued that the temporally distant self may be perceived 'as an other'.

Choice of Study for Replication

We chose to replicate Pronin and Ross (2006) based on two factors: absence of direct replications and impact. Although the article has been highly influential, to our knowledge, there are no published direct replications of this work. At the time of writing, there were a total of 298 Google Scholar citations of the article and many impor-

tant follow-up theoretical and empirical articles. Although Pronin and Ross (2006) did not investigate the effects of temporal and social distance on measures beyond trait attributions, high-impact follow-up research has shown the implications of temporal distance on behaviors relating to moral actions (e.g., Agerström & Björklund, 2009; Hershfield, Cohen & Thompson, 2012; Van Gelder, Hershfield & Nordgren, 2013) and long-term saving (Bryan & Hershfield, 2013; Ersner-Hershfield et al., 2009).

These studies extended Pronin and Ross's (2006) findings and demonstrated practical implications. For example, when making assessments about the ethicality of morally questionable behavior (e.g., choosing to not participate in blood donation during a health crisis), people are more likely to give harsher moral judgments when the behavior is described to occur in the distant future as opposed to the near future (Agerström & Björklund, 2009). Relating back to CLT, because distant future events are construed on a higher level, people are more likely to attribute morally questionable behaviors to disposition (e.g., 'She's selfish.') as opposed to situational factors (e.g., 'She just recovered from a flu and thus cannot donate blood right now.'), leading to harsher judgments.

Furthermore, although prior researchers have suggested parallels in temporal asymmetry for both past and future selves (e.g., Trope & Liberman, 2003), Pronin and Ross (2006) were the first to directly compare assessments made across multiple temporal distances (past vs. present vs. future) and social distances (self vs. friend). By doing so, they were able to expand upon the literature by demonstrating that manipulations in temporal distance have a similar effect to manipulations in social distance, as predicted by CLT.

Pronin and Ross (2006) has been a highly influential article. A meta-analysis by Malle (2006) of 173 published studies regarding the actor-observer asymmetry surprisingly found only very weak effects ($d = 0.016$ to $d = 0.095$), the significance of which depended on the specifics of the study's design (e.g., intimacy of the relationship between actor and observer, how variables were coded, how hypothetical events were described, and valence of hypothetical events). These findings called into question the robustness of the classic actor-observer bias, especially in regard to its applicability to real-world situations which are highly idiosyncratic. Considering the similarity between the effects of temporal distance and social distance on trait attributions, this may indicate similar concerns regarding the replicability and robustness of temporal distance effects. As discussed by Coles et al. (2018), in situations wherein the reliability of findings are uncertain, direct replications may be of greater utility than conceptual replications. Furthermore, the small sample size of the original study may indicate it was underpowered and with possibly overestimated effect sizes.

Given these reasons, we aimed to revisit the classic phenomenon to examine the reproducibility and replicability of the findings by conducting an independent replication of the study. Following the recent growing recognition of the importance of reproducibility and replicability in psychological science (e.g., Open Science Collaboration, 2015; Zwaan et al., 2018), we embarked on a well-powered, pre-registered very close replication of Pronin and Ross (2006). Also, by doing so, we aim to contribute to obtaining a more precise estimate of the observed effects for this phenomenon.

Summary of Original Studies and Current Replication

Overall, Pronin and Ross (2006) consisted of seven studies examining the effect of temporal distance on trait ascriptions. We focused the current replication on Studies 1, 2, and 3 due to their similar hypotheses and experimental design. In this section, we outline the hypotheses (refer to Table S5 in supplementary), experimental design (refer to Table S1 in supplementary), and findings (refer to Table S6 in supplementary) of each study before providing an overview of the current replication based on these studies. We report a more comprehensive analysis of each study in the section 'Analysis of Studies 1–3 from Pronin and Ross (2006)' in the supplementary.

In Study 1, Pronin and Ross (2006) tested the hypothesis that participants would ascribe a greater number of traits, and a lesser number of ascriptions to situational variability when assessing their friends (Hypothesis 1) or their past selves (Hypothesis 2) compared to their present selves. Confirming their hypothesis, they found that compared to an assessment of their present selves, participants indeed ascribed a greater number of traits to their friends ($f = 0.35$ [0.09, 0.61]) and their past selves ($f = 0.43$ [0.17, 0.69]).

Expanding on Study 1, in Study 2, the authors demonstrated that this temporal asymmetry in trait ascriptions not only applies to those made of the past self but also for the future self. Participants did ascribe more traits to their future selves compared to their present selves ($f = 0.51$ [0.17, 0.84]).

Lastly, in Study 3, the authors investigated an alternate hypothesis for the observed temporal asymmetry in self trait ascriptions detected in Studies 1 and 2—the self-enhancement hypothesis. According to this alternate hypothesis, participants ascribe a greater number of traits to their past (Study 1) and future self (Study 2) due to a self-enhancing motive to see themselves as improving over time, not due to the manipulation of temporal distance. If this were true, participants would ascribe more negative traits to their past self, more ascriptions to situational variability for their present self, and more positive traits to their future self.

As such, they first sought to replicate the findings of Studies 1 and 2 that participants would ascribe a greater number of traits to their past and future selves compared to their present selves. Further, they hypothesized that if self-enhancement was the true motive behind temporal asymmetry, then participants would ascribe more negative traits to their past selves, more ascriptions to situational variability for their present selves, and more positive traits for their future selves. They replicated the findings from Study 1 and 2 ($f = 0.54$ [0.27, 0.77]), yet failed to find support for the self-enhancement hypothesis. Although participants attributed more positive than negative traits to their present selves ($f = 0.77$ [0.29, 1.25]), the effect was weaker for temporal distance ($f = 0.16$ [0.00, 0.36]).

Overview of Current Replication

Given the similarities between Studies 1, 2, and 3, we combined the experimental design of the three studies into a single 3 (temporal distance: past vs. present vs. future) × 2 (social distance: self vs. friend) between-subjects experimental design for the current replication. We summarized details regarding the adjustments to the current replication in comparison to the original in **Table 1**.

Extension: Self-Serving Bias in Trait Ascriptions About the Self

As an extension to the replication study, we wanted to examine whether, as a result of self-serving bias (SSB), participants would ascribe a greater ratio of positive traits compared to negative traits when they were making judgments about themselves in contrast to when they were making judgments about others.

In Study 3 of Pronin and Ross (2006), the authors found that regardless of temporal distance, participants ascribed a greater number of positive traits compared to negative traits when making judgments about themselves, taken to demonstrate SSB. However, they did not investigate whether the same applies when participants make judgments about others (e.g., their friends). By combining the design of Study 1, which examined differences in situational and trait attributions for self vs. friend judgments, and Study 3, which measured differences in negative and positive trait attributions for self-judgments across temporal distance, we were able to compare the differences in the ratio of positive and negative trait attributions across both temporal and social distance simultaneously.

According to the SSB, people are more likely to attribute personal failures to situational factors (e.g., 'I failed the test *because I was sick* the night before and was not able

Table 1: Comparison of original versus the replication: Adjustments and reasons for change.

Item	Original	Replication	Reason for change
Study design	3 separate designs: Study 1: 2 (past vs. present) × 2 (self vs. friend) between-subjects design Study 2: present self vs. future self, between-subjects design Study 3: mixed design. Past vs. present vs. future self between subjects design, and negative vs. positive trait attributions as within subjects	3 (temporal distance: past vs. present vs. future) × 2 (social distance: self vs. friend) between-subjects design	Combined Studies 1–3 into one study due to similar experimental designs that do not conflict with each other
Conditions	Participants randomly assigned to one of ... · Four experimental conditions (past friend vs. present friend vs. past self vs. future self) in Study 1	Participants randomly assigned to one of six experimental conditions: · 6 between-subject experimental conditions in total: past-self vs. present self vs. future self vs. past friend vs. present friend vs. future friend · (Added future friend condition as an extension)	Same as above
Procedure	Participants were told to answer the scales according to the condition they were randomly assigned to. (RA asked to verify manipulation for IV2)	Same instructions as the original with a few additions: · Added comprehension check throughout the survey · Added manipulation check for IV2 (positive vs. negative traits) at the end of the survey	To account for the MTurk sample, we had to add comprehension checks to make sure participants were paying attention. A manipulation check was also added, since in the original study they had an RA verify the manipulation, but it may not be applicable for MTurk sample.
Measures	Online web survey: · Study 1 and Study 2 used the same scales. Study 3 used a modified scale with opposite valenced traits. · 1 measure has 11 scales. · Items are in fixed order.	Online Qualtrics survey: · Combined scales from Studies 1 and 2 and Study 3 into one set of scales with the order of the items randomized. · 1 measure has 22 scales.	Since we combined the experimental design of Studies 1–3, we combined the two measures in one, in randomized order, as separating them would have statistical implications.
Participant population	Undergraduate university students and university staff (only Study 1) recruited through a university database email	Recruited through the online platform Amazon MTurk	To make the results more generalizable beyond university populations. Since MTurk samples are more diverse agewise, we did not have to separate them into two sample groups (university staff and university students)

to study.'), yet attribute others' failures to dispositional factors (e.g., 'She failed the test *because she's lazy.*'). This is differentiated from the actor-observer bias because the SSB specially applies to valenced situations, wherein people are likely to attribute negative incidents to situational explanations and positive incidents to dispositional factors when assessing themselves but not others. The reasons for the SSB are twofold: motivational factors (i.e., to self-enhance and present the self in a favorable light) and differences in the availability of information regarding one's own actions versus other's actions (Shepperd et al., 2008). The meta-analysis by Malle (2006) supports this idea, finding that the actor-observer asymmetry is stronger for negative events, whereas the opposite occurs for positive events.

Drawing from this theory of SSB, we therefore hypothesized that participants would attribute fewer negative traits when making assessments about themselves but not others. We predicted that, in general, participants would ascribe fewer negative traits to themselves, as they would explain away negative experiences as resulting from situational variables instead of negative dispositional factors. In contrast, positive experiences are more likely to be attributed to positive dispositional factors instead of situational variables. Furthermore, since SSB results from motivational factors and the disparity in self vs. other information, we predicted that this effect would be greater when making self-judgments compared to judgments of others.

Practically, these findings may have important implications. Although SSB can be adaptive when applied in certain circumstances, it can also be maladaptive in others. For example, in situations which cannot be changed, attributing these negative outcomes to internal causes can have negative consequences on one's self-esteem, sense of agency, and affect regulation. In these cases, attributing to external factors is more optimal. However, in situations where change is possible, attributing negative outcomes to external causes can prevent people from improving their outcomes. By repeatedly attributing negative events (e.g., financial, academic, or relationship failures) to situational factors (e.g., bad luck, fault of others), people may fail to learn from bad experiences. Take the example of a bankrupt investor who is repeatedly investing in the same type of bad businesses and losing increasingly more money or of a person who has been through multiple divorces and is repeatedly entering romantic relationships with incompatible partners. By evading personal responsibility, they fail to learn and make amendments to their behaviors to prevent similar events from happening in the future, as they never see it as being 'their fault'. Evidently, a better understanding of SSB processes is crucial in regard to enabling us to maximize its adaptive advantages while minimizing its negative consequences.

Pre-Registration and Open Science

We first pre-registered the experiment on the Open Science Framework (OSF), and data collection was launched later that week (https://osf.io/yrvuq). Datasets and R/RMarkdown code were made available on the OSF (https://osf.io/gs2rx/). Open science details and disclosures, power analyses, and all materials used in these experiments are available in the supplementary materials. All measures, manipulations, and exclusions conducted for this investigation are reported; all studies were pre-registered with power analyses reported in the supplementary; and data collection was completed before analyses.

Method

Power Analysis

To ensure that the current replication sample has sufficient power, we calculated effect sizes (ES) and power based on the statistics reported in the target article. To ensure that the sample can detect even the smallest effect, we chose the smallest yet still statistically significant ($p < 0.05$) observed effect size (calculated in Table S13 in the supplementary) for each study to base our power analyses on.

Furthermore, since publication bias often inflates ESs detected in published studies (Ioannidis, 2008), and considering the heterogeneity of ES across studies (McShane & Bockenholt, 2014), replications based on the reported ES of the target study may be underpowered (Shrout & Rodgers, 2018). To combat this, we implemented the *safeguard power analysis method* (Perugini, Gallucci, & Costantini, 2014), which bases power analysis on the lower 60% confidence interval of the target effect size. This method involved calculating the 60% confidence interval (e.g., 0.19, 0.45) of the target effect size and then basing the power analysis on the lower bound effect size (e.g., 0.19). Afterwards, we then chose the maximum required sample size out of the three to become the required sample for the current replication. We concluded that the minimum required sample size for a power of 0.95 and alpha of 0.05 is 362 participants. We provided more information regarding these calculations in Tables S13 and S14 in the supplementary.

Participants and Sensitivity Analysis

Based on these aforementioned calculations, we recruited a total of 911 American Amazon Mechanical Turk (MTurk) using CloudResearch/TurkPrime (Litman et al., 2016) in return for USD 0.63 based on calculations of USD 7.5/hour to meet minimum federal wage. After excluding the participants who fulfilled the pre-registered exclusion criteria (refer to the 'Pre-Exclusions Versus Post-Exclusions' section in the supplementary), this sample was reduced to 878. However, it should be noted that the replication sample ($n = 291$) is smaller than the estimated sample for Study 1 ($n = 362$). We conducted a post hoc sensitivity analysis using the pwr.t.test() function from the *pwr* (Champely et al., 2018) package in R and found that the replication was sensitive to detect an effect of $d = 0.39$ with 95% power and effect of 0.29 with 80% power (one-sided; refer to 'VI. Sensitivity Analysis' in the supplementary for further details). A comparison of the target article sample and the replication samples is provided in **Table 2**.

Design and Procedure

We summarized the experimental design in Table S15 in the supplementary. Based on our analysis of the original

Table 2: Difference and similarities between original study and replication (after exclusions).

	Pronin and Ross (2006)				American MTurk workers		
	Study 1		Study 2	Study 3	Self conditions	Other conditions	Overall
	Student sample	Staff sample					
Sample size	123	44	40	75	438	440	878
Geographic origin	–	–	–	–	US American		
Gender	42 males, 81 females	65 females, 3 males	26 females, 14 males	39 females, 35 males, 1 not reported	232 females, 203 males, 3 not disclosed	224 females, 210 males, 6 not disclosed	413 males, 456 females, 9 not disclosed
Median age (years)	19	47	–	–	37	36	37
Average age (years)	–	–	–	–	40.09	39.4	39.75
Age range (years)	–	–	–	–	18–73	19–76	18–76
Medium (location)	Completed via a web-based questionnaire						
Compensation	Course requirement	None	Course credit	Candy bars	Monetary		
Year	2006				2020	2020	2020

article (see 'Analysis of Studies 1–3 from Pronin & Ross (2006)' in supplementary), we decided to combine the experimental design of Studies 1, 2, and 3 from Pronin and Ross (2006) into a single 3 (temporal distance: past and present and future) by 2 (social distance: self and friend) between-subject design due to their methodological similarity and non-conflicting design (refer to the corresponding section in the summary for full justification on the combined design). The display of conditions was counterbalanced. We provided more details and all measures in the 'Materials and Scales Used in the Replication + Extension Experiment' section in the supplementary.

Participants were randomly assigned to one of six experimental conditions, and they responded to a series of scales. At the end of the experiment, they answered a number of funneling questions and provided their demographic information. We provided a more comprehensive overview of the survey procedure in Table S17 in the supplementary.

Manipulations

Each participant was randomly assigned to provide assessments about one of the following targets: (1) self in the past, (2) self in the present, (3) self in the future, (4) a friend in the past, (5) a friend in the present, or (6) a friend in the future. We provided additional details of the differences in manipulation between the six conditions, the experimental design, and the complete scales used in the current replication in Table S15 in the supplementary.

IV1: Temporal Distance (Between)

We asked participants to make judgments about either themselves or their friend (depending on IV2) 'five years ago' (past), 'right now' (present), or 'five years from now' (future).

IV2: Social Distance (Between)

We asked participants to assess either themselves or a friend that they have known for at least five years.

Measures

Total Trait Ascriptions

Differences in trait ascriptions were measured using a set of 22 items. This set was created by combining the two scales used in Pronin and Ross (2006) Studies 1–3 into a single set, which were then presented in randomized order to the participants to address any potential order effects. Each scale presented three possible options: two opposing traits (e.g., serious-carefree) and a third option (variable/depends on the situation). For each scale, participants had to choose one of the three options which best describe the person designated by the experimental condition they were assigned to. For example, if they were assigned to the 'past self' condition, they had to choose which of the three options best described themselves five years ago. Similarly, if they were assigned to the 'future friend' condition, they had to choose which would best describe their friend five years from now. Afterwards, each participant's answers were converted into a single score representing the total amount of trait ascriptions (e.g., choosing 'serious' or 'carefree') they made as opposed to ascriptions to situational variability (e.g., choosing 'variable/depends on the situation' instead of 'serious' or 'carefree'). In the supplementary, we detailed the 22 items presented to the participants in Table S15 and the original scales used in Studies 1, 2, and 3 in Pronin and Ross (2006) in Table S4.

Negative and Positive Trait Ascriptions

To test the self-enhancement hypothesis, Pronin and Ross (2006) modified the 11 scales in Study 3 so that the trait pairs in each scale were oppositely valenced, meaning that

one was obviously positive (P) while the other was obviously negative (N). In the present study, we combined the 11 scales used in Study 3 with the 11 scales used in Studies 1 and 2, resulting in a total of 22 scales. As detailed in Table S15, scales numbered 12 to 22 were oppositely valenced to the first 11 scales. For example, the pair 'serious-carefree' was modified to become 'uptight (P)–easygoing (N)'. Each participant's answers were then summarized into two scores, one representing the total number of positive trait ascriptions they made (as opposed to negative trait ascriptions or ascriptions to situational variability) and the other representing the total number of negative trait ascriptions they made.

Valence of Traits

To ensure that the manipulation of valenced trait pairs were effective, participants were asked to rate 22 traits from the 11 scales in regard to how desirable or desirable each one is on a Likert scale of –3 (*Very negative*) to 3 (*Very positive*).

Evaluation Criteria for Replication Findings and Classification

To evaluate the results of the current replication, we followed the recommendations set by LeBel, Vanpaemel, Cheung, and Campbell (2019) and did so based on the following criteria: signal presence, consistency between the effect size of the original study and the present replication, and the precision of its estimate between the replication and target study. Results of the present replication will be interpreted following the aforementioned criteria, with consistency referring to the effect size instead of the direction of the effect. We provided more details in Figure S2 under the section 'Evaluation Criteria for Replication Findings' in the supplementary.

To classify the replication, we followed the criteria by LeBel, McCarthy, Earp, Elson, and Vanpaemel (2018) which evaluates the methodological similarity between the original study and the replication study depending on various design facets (refer to Figure S2 in the supplementary for specific details). Based on this, we classify the current replication as a 'very close replication' (refer to **Table 3** for specific details).

Pre-Registered Data Analysis Strategy

To reduce 'researcher degrees of freedom' (Simmons et al., 2011), we carried out data analysis following our pre-registered plan (https://osf.io/yrvuq). Any changes that we made from this pre-registered plan were noted and justified in the 'Comparisons and Deviations' section in the supplementary. We used R/RStudio (R Core Team, 2013) to complete data cleaning, manipulation, and analyses. For a detailed discussion of how we detected and managed outliers and assumptions of the statistical tests, refer to the corresponding sections in the supplementary.

Table 3: Classification of the replication, based on LeBel et al. (2018).

Design facet	Replication	Details of deviation
IV operationalization	Same	–
DV operationalization	Same	–
IV stimuli	Same	–
DV stimuli	Similar	The two different sets of scales (each containing 11 scales) from Studies 1–2 and 3, respectively, were combined into one set of scales (containing 22 scales) presented in randomized order.
Procedural details	Similar	1. For the friend conditions, we asked participants to note the initials of the friend they were thinking of so it can be piped into the following questions. 2. We added comprehension checks to ensure that participants were paying attention. 3. We added a manipulation check for IV2 at the end of the survey which asked individuals to rate 22 traits in terms of their valence (how desirable/undesirable).
Physical settings	Similar	Both studies were conducted via a web-based questionnaire. The present study uses Qualtrics and the Amazon MTurk platform.
Contextual variables	Different	The original sample was predominantly undergraduate university students and female. Meanwhile, the present sample is recruited from the Amazon MTurk platform.
Replication classification	Very close replication	

Note: See supplementary Figure S3 and Lebel et al. (2018) for details about categorization and the added 'Similar' rational, referring to 'minor deviations or extensions aimed to adjust the study to the target sample that are not expected to have major implications on replication success'.

Effect of Temporal and Social Distance on Trait Ascriptions

In each of the three studies reported in Pronin and Ross (2006), they conducted a between-subjects analysis of variance (ANOVA) with temporal distance (past vs. present in Study 1; present vs. future in Study 2; past vs. present vs. future in Study 3) as the IV and total trait ascriptions as the DV to test the effect of temporal distance on trait ascriptions. Additionally, in Study 1, they also conducted a between-subjects ANOVA with social distance (self vs. friend) as the IV and trait ascriptions as the DV. In Study 3, they also added a second DV: the total number of positive trait ascriptions.

Given that we combined the designs of Studies 1, 2, and 3 in the current replication, we began our analysis by conducting a 3 (past vs. present vs. future) × 2 (self vs. friend) between-subjects multivariate analysis of variance (MANOVA), with total number of trait ascriptions (DV1) and total number of positive trait ascriptions (DV2) as the dependent variables, to examine whether temporal distance and social distance have an impact on trait ascriptions. This choice was based on the recommendations by Huberty and Morris (1992). A MANOVA was used to examine how both the total number of positive trait ascriptions (DV2) and the number of trait ascriptions (DV1) accounted for the group differences between the experimental conditions and also to investigate how variations in temporal distance and social distance relatively contributed to the group differences in outcome variables within a multivariate context. This would be beyond the scope of multiple ANOVAs.

Afterwards, we conducted follow-up ANOVAs for each DV and IV, respectively, to further examine the underlying factors contributing to the MANOVA results we had obtained. Given that these variables were initially studied in univariate contexts in the studies by Pronin and Ross (2006) (refer to the original article analysis in supplementary for more details), we conducted multiple ANOVAs to enable better comparison with the original studies and to examine the individual effects.

As such, to first investigate whether the total number of trait ascriptions (DV1) varied based on temporal distance (IV1) and social distance (IV2), we conducted a 2 (self vs. other) × 3 (past vs. present vs. future) between-subjects ANOVA with total traits as the DV. We also did the same for the total number of positive traits (DV2). Then, to examine whether social distance (IV2) had an impact on trait ascriptions (DV1), we conducted a between-subjects ANOVA with social distance (self vs. other) as the independent variable and the total number of trait ascriptions as the DV. Then, to examine whether temporal distance (IV1) influenced trait ascriptions (DV1), we conducted another between-subjects ANOVA with the total number of trait ascriptions as the DV but with temporal distance (past vs. present vs. future) as the independent variable.

Finally, to replicate the findings of Studies 1 and 2 of Pronin and Ross (2006), we conducted two independent t-tests, one comparing past vs. present self trait ascriptions (Study 1), and the other comparing present vs. future self trait ascriptions (Study 2).

Self-Enhancement Hypothesis

To test the alternative self-enhancement hypothesis in Study 3, Pronin and Ross (2006) first conducted a dependent t-test comparing negative and positive trait ascriptions in the present-self group followed by a one-way ANOVA comparing the ratio of positive-to-total trait ascriptions in the past-, present-, and future-self conditions. Following the original study, we first conducted a paired samples t-test to see whether there are differences in the ratio of positive trait ascriptions in the present-self group, taken as demonstrating a motive to self-enhance. Then, to examine whether this ratio varied across different temporal differences in the self conditions, we conducted a one-way ANOVA (past vs. present vs. future) with the ratio of positive-to-total trait ascriptions as the DV. If we found support, we followed with post hoc tests in the form of an independent samples t-test to further explore the differences.

Extension: Positivity Effect in Trait Attributions About the Self

As an extension, we conducted a one-way MANOVA with social distance (self vs. friend) as a predictor and total negative traits and total positive traits as the dependent variables. We did so to investigate whether people would ascribe a greater number of positive traits and a lesser number of negative traits when making assessments about themselves compared to when they were making assessments about others. If we found support for the model, we would follow with two one-way ANOVA for negative traits and positive traits separately.

Results

Replication

We summarized all descriptive statistics of all measures in **Table 4**. Statistical tests of the hypotheses are plotted in **Figure 1** for total trait ascriptions (DV1) and **Figure 2** for total number of positive trait ascriptions (DV2). We summarized a comparison of the findings of the current replication and the original findings of Studies 1, 2, and 3 from Pronin and Ross (2006) in **Table 5**.

Outlier Detection and Assumptions Checks

Following the pre-registered plan, we first screened the data for both multivariate and univariate outliers. We included more information regarding the results of these assumption checks in Table S20 in the supplementary. Since the tests revealed that the data did not meet the assumptions of normality and skewness, we conducted the planned tests using robust statistical methods as a supplemental analysis in addition to the parametric versions to mirror what was originally done by Pronin and Ross (2006). We found no indication for differences between the results of the parametric and the robust tests, and we therefore focused our reporting of the results on the parametric tests. The results of the robust tests are presented in Table S21 in the supplementary.

Table 4: Descriptive statistics.

	IV1: Past *M(SD)*			IV1: Present *M(SD)*			IV1: Future *M(SD)*			Overall *M(SD)*		
	Total traits	**Positive traits**	**Negative traits**	**Total traits**	**Positive traits**	**Negative traits**	**Total traits**	**Positive traits**	**Negative traits**	**Total traits**	**Positive traits**	**Negative traits**
IV2: Self	16.17 (4.95)	5.03 (2.62)	3.18 (2.43)	16.28 (4.52)	5.64 (2.70)	2.58 (2.20)	16.03 (4.17)	6.86 (2.43)	1.49 (1.76)	16.16 (4.55)	5.84 (2.69)	2.42 (2.25)
		N = 147			*N* = 144			*N* = 147			*N* = 438	
IV2: Friend	17.23 (4.21)	6.68 (2.54)	2.17 (2.17)	16.63 (3.92)	6.74 (2.51)	1.98 (2.07)	17.21 (3.61)	7.20 (2.39)	1.70 (1.83)	17.02 (3.92)	6.87 (2.48)	1.95 (2.03)
		N = 146			*N* = 147			*N* = 147			*N* = 440	
Overall	16.70 (4.62)	5.85 (2.71)	2.68 (2.35)	16.46 (4.23)	6.20 (2.65)	2.28 (2.15)	16.62 (3.94)	7.03 (2.41)	1.60 (1.79)	16.59 (4.27)	6.36 (2.64)	2.18 (2.16)
		N = 293			*N* = 291			*N* = 294			*N* = 878	

Note: M indicates mean. *SD* indicates standard deviation. *N* indicates the sample size for that box. Total traits were calculated by averaging the total number of trait ascriptions (choosing one of the two trait descriptors and not choosing the third situational descriptor) each participant made in each condition. As discussed in the manipulations section, positive/negative were only in 11 out of the 22 items. As such, the range of total traits is 0–22, while the range for positive and negative is 0–11 (referring only to items 11–22 that had valence).

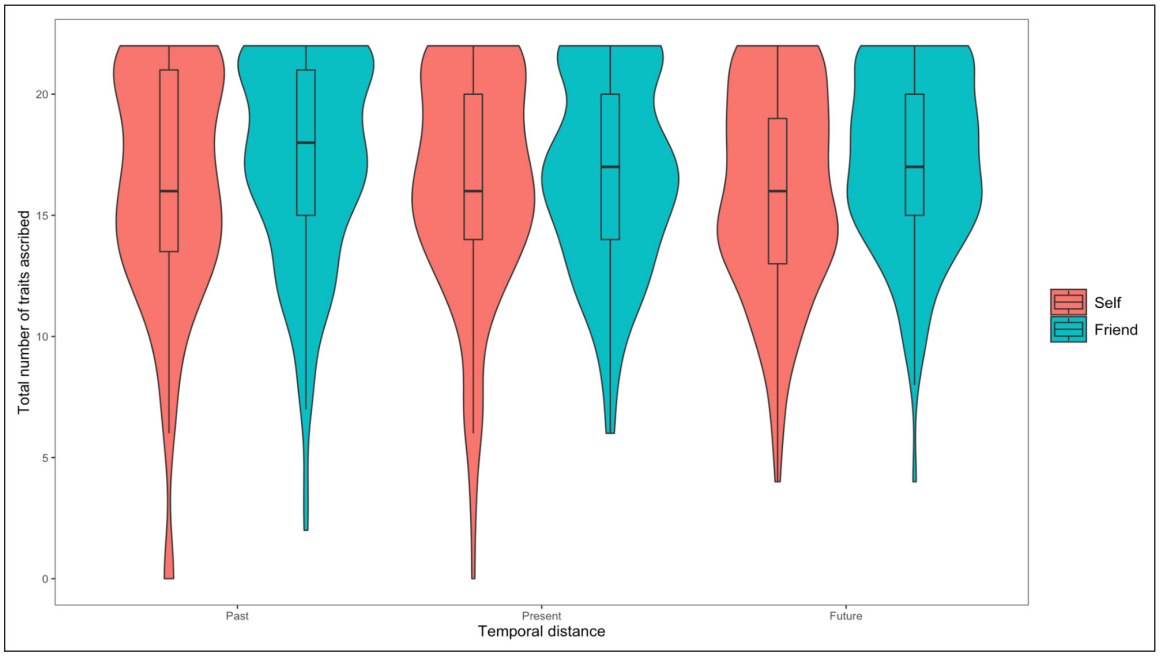

Figure 1: Plot for the mean number of overall trait ascriptions participants made regarding themselves versus others across temporal distance with a possible range of 0–22.

Effects of Temporal and Social Distance on Total Trait Ascriptions and Positive Trait Ascriptions

To investigate the effects of social and temporal distance on trait ascriptions, we first conducted a 3 (temporal: past vs. present vs. future) × 2 (social: self vs. other) between-subjects MANOVA. Similar to what Pronin and Ross (2006) found in their Study 1, we found support for multivariate main effects of temporal distance ($F(4, 1742) = 10.65$, $p < 0.001$, $f = 0.16$, 95% CI [0.10, 0.20]). Additionally, we found support for multivariate main effects of social distance (F (2, 871) = 18.17, $p < 0.001$, $f = 0.20$, 95% CI [0.13, 0.27]), and the interaction between temporal distance and social distance (F (4, 1742) = 3.89, $p = 0.004$, $f = 0.09$, 95% CI [0.03, 0.13]) on the number of participants' trait ascriptions. This suggests that participants varied in the type of trait ascriptions they made (situational vs. dispositional), depending on social and temporal distance.

We conducted two additional follow-up 2 × 3 ANOVAs on each DV to further tease apart the effect of both temporal and social distance on the number of trait ascriptions (DV1) and the total number of positive trait ascriptions (DV2), and we found support for the effect of social distance on both DV1 and DV2 yet failed to find support for temporal distance.[1] In the follow-up analyses presented below, we further explored these differences.

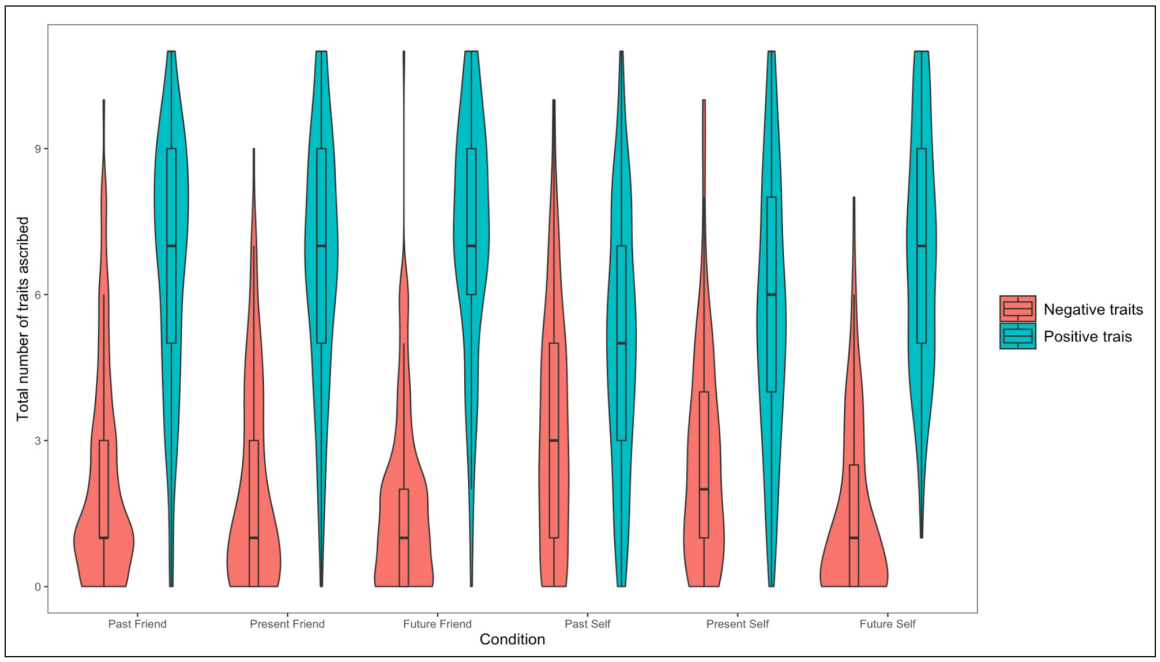

Figure 2: Plot for the mean number of overall negative and positive trait ascriptions in each experimental condition, with a possible range of 0–11 (referring only to items 11–22 that had valence).

Table 5: Summary and comparison of findings of the current replication study and those of Pronin and Ross (2006) based on the criteria by LeBel et al. (2019).

Study	Hypothesis		Target effect	Original effect size (Cohen's *f*)	Replication effect size (Cohen's *f*)	Interpretation
	No.	Description				
1	1a	Actor-observer asymmetry in self vs. other (friend) trait ascriptions	Social distance (self vs. friend)	0.35, 95% CI [0.09, 0.61]	0.10, 95% CI [0.04, 0.17]	Signal Inconsistent Smaller
	1b	Temporal asymmetry resembles actor-observer asymmetry	Temporal distance (past vs. present)	0.43, 95% CI [0.17, 0.69]	–0.01, 95% C.I. [–0.21, 0.19]	No signal Inconsistent
2	2	Temporal asymmetry in trait self-ascriptions	Temporal distance (present vs. future)	0.51, 95% CI [0.17, 0.84]	0.03, 95% C.I. [–0.20, 0.25]	No signal Inconsistent
3	3a	Self-enhancement hypothesis of temporal asymmetry in trait self-ascriptions	Ratio of positive-to-total trait ascriptions (present self)	0.77, 95% CI [0.29, 1.25]	0.88, 95% CI [0.50, 1.26]	Signal Consistent
	3b		Ratio of positive-to-total trait ascriptions (past vs. present vs. future self)	0.16, 95% CI [0.00, 0.36]	0.33, 95% CI [0.22, 0.42]	Signal Inconsistent Larger
	3c	Temporal asymmetry	Temporal distance (past vs. present vs. future)	0.54, 95% CI [0.27, 0.77]	0.02, 95% CI [0.00, 0.06]	No signal Inconsistent

Social Distance: Self-Other Asymmetry in Total Trait Ascriptions

Mirroring Pronin and Ross's (2006) Study 1, we conducted a follow-up univariate ANOVA to further investigate the effect of social distance on trait ascriptions. We found support for the hypothesis that trait ascriptions would differ based on social distance, $F(1, 876) = 9.02$, $p = 0.003$, $f = 0.10$, 95% CI [0.04, 0.17]. That is, participants ascribed a greater number of traits, as opposed to ascriptions to situational variability, when making judgments about their friend ($M = 17.02$, $SD = 3.92$, $N = 440$) compared to when they were making judgments about themselves ($M = 16.16$, $SD = 4.55$, $N = 438$). Since Cohen's f CI excluded zero but did not include the original ES point estimate, we concluded that a signal was detected, yet the replication ES for hypothesis 1a was inconsist-

ent with the original, as the magnitude of the effect was smaller.

Temporal Distance: Temporal Asymmetry in Total Trait Ascriptions About the Self

Then, to further investigate the effect of temporal distance on participants' trait ascriptions, we conducted another univariate ANOVA aiming to replicate the findings in Pronin and Ross's (2006) Study 3, followed by independent t-tests aiming to replicate the findings of their Studies 1 and 2. Unlike the findings of Study 3, we failed to find support for the hypothesis that trait ascriptions would differ based on temporal distance, $F(2, 872) = 0.24$, $p = 0.791$, $f = 0.02$, 95% CI [0.00, 0.06]. Since Cohen's f CI included zero and excluded the original ES point estimate, we concluded that no signal was detected and that the replication ES for hypothesis 3c is inconsistent with the original.

Inconsistent with the findings of Study 1 from Pronin and Ross (2006), we failed to find support for differences between the trait ascriptions that participants made of their past ($M = 16.17$, $SD = 4.95$, $N = 147$) or present self ($M = 16.28$, $SD = 4.52$, $N = 144$), $t(287.58) = -0.21$, $p = 0.837$, $f = -0.01$, 95% CI [–0.21, 0.19]. Since Cohen's f CI included zero and excludes the original ES point estimate, we conclude that no signal was detected and that the replication ES for hypothesis 1b is inconsistent with the original.

Furthermore, inconsistent with the findings in Pronin and Ross's (2006) Study 2, we failed to find support for differences in the trait ascriptions people made between their present self ($M = 16.63$, $SD = 3.92$, $N = 144$) and future self ($M = 17.21$, $SD = 3.61$, $N = 147$), $t(286.01) = 0.49$, $p = 0.623$, $f = 0.03$, 95% CI [–0.20, 0.25]. Since Cohen's f CI included zero and excluded the original ES point estimate, we concluded that no signal was detected and that the replication ES for hypothesis 2 is inconsistent with the original ES.

Self-Enhancement Hypothesis: Temporal Asymmetry in Ratio of Positive-to-Total Trait Ascriptions

Present Self: Ratio of Positive-to-Total Trait Ascriptions

To test the self-enhancement hypothesis, we first conducted a paired-samples t-test. In accordance with the findings from Study 3 in Pronin and Ross (2006), participants were more likely to ascribe positive traits ($M = 5.64$, $SD = 2.70$, $N = 144$) to their present self compared to negative traits ($M = 2.58$, $SD = 2.20$, $N = 144$), $t(274.72) = 10.55$, $p < 0.001$, $f = 0.88$, 95% CI [0.50, 1.26]. Since Cohen's f CI excluded zero and included the original ES point estimate, we concluded that signal was detected and that the replication ES for hypothesis 3a was consistent with the original.

Temporal Distance and Self: Ratio of Positive-to-Total Trait Ascriptions

We then proceeded to investigate whether the ratio of positive-to-total trait ascriptions would vary over different temporal distances using a one-way ANOVA. In contrast to the findings of Study 3 in Pronin and Ross (2006), we found that participants attributed a different ratio of positive-to-total traits depending on temporal distance, $F(2, 430) = 22.83$, $p < 0.001$, $f = 0.33$, 95% CI [0.22, 0.42]. More specifically, participants ascribed a greater ratio of positive traits in the future-self condition ($M = 0.44$, $SD = 0.15$, $N = 147$) compared to the present-self condition ($M = 0.35$, $SD = 0.15$, $N = 144$) and past-self condition ($M = 0.32$, $SD = 0.17$, $N = 147$). Since Cohen's f CI excluded zero and excluded the original ES point estimate, we concluded that the replication ES for hypothesis 3b was inconsistent with the original, as the magnitude of the effect was larger.

Extension: Self-Other Asymmetry in Positive Trait Ascriptions

We ran an extension to examine whether people would ascribe more positive traits and fewer negative traits to themselves compared to their friends. Since data screening revealed that the data did not meet the assumptions required for parametric tests, we conducted a robust one-way MANOVA to test this. We found that the number of positive and negative trait ascriptions varied depending on social distance, $F(2, 875) = 34.76$, $p < 0.001$.

Following this, we conducted robust one-way ANOVAs to investigate the contribution of each dependent variable to the main effects. For the model with positive traits as the dependent variable, we found that participants were more inclined to ascribe a greater number of positive traits to their friends ($M = 6.87$, $SD = 2.48$, $N = 440$) compared to themselves ($M = 5.84$, $SD = 2.69$, $N = 438$), $F(1, 525.1) = 48.86$, $p < 0.001$, $\xi = 0.3$, 95% CI [0.21, 0.39]. For the model with negative traits as the dependent variable, participants were more likely to ascribe a greater number of negative traits when they were making judgments about themselves ($M = 2.42$, $SD = 2.25$, $N = 438$) compared to those they made of their friends' ($M = 1.95$, $SD = 2.03$, $N = 440$) conditions, $F(1, 524.19) = 11.00$, $p < 0.001$, $\xi = 0.17$, 95% CI [0.07, 0.26].

In summary, participants surprisingly ascribed a more favorable ratio of positive traits compared to negative traits to their friends than to themselves.

Comparing Replication to Original Findings

We compared the target article to our replication using the LeBel et al. (2019) replication evaluation criteria and summarized our findings in **Table 5**. Whenever we detected a signal in the replication, it was always in the same direction as in the original. Interestingly, although hypothesis 3b was not supported in the original study, the present replication was able to find support for the hypothesis, consistent with the original authors' reasoning. Detection of the effect was possibly due to our replication being better powered than the original.

Discussion

We conducted a pre-registered replication of temporal asymmetry (Pronin & Ross, 2006) with the twofold aim of assessing the replicability of its findings and extending the study by investigating the impact of social distance on the self-enhancement hypothesis. The evaluation of the current replication study was done according to the

criteria set by LeBel et al. (2019), and the corresponding comparison of the results of the target article and the current study is presented in **Table 5**. We summarized information regarding the similarities and differences between the original article and the present replication in the 'Original Versus Replication' section in the supplementary.

Overall, the findings of the current replication were inconclusive, as it was mixed in terms of consistency with the original findings of Pronin and Ross (2006) regarding the effect of social distance, temporal distance, and the motive to self-enhance. As will be further discussed, we successfully replicated some effects, although we were unable to find support for the core hypotheses regarding temporal asymmetry. For the effect of social distance, we found that, although smaller in the magnitude of the effect, participants were more likely to ascribe dispositional traits, as opposed to situational ascriptions, when making assessments about their friends compared to themselves. We were unable to replicate the effect of temporal distance, as no signal was detected, and the ES is inconsistent with the original. Whereas Studies 1, 2, and 3 of Pronin and Ross (2006) found that participants attributed a greater number of dispositional traits to their past or future self compared to their present self, the current study was not able to detect such a difference. However, we were able to find support for the alternate self-enhancement hypothesis, as the ES detected signal and is consistent with the original. Meaning, participants tended to attribute a favorable ratio of positive-to-total traits when making assessments about themselves in the present. Furthermore, whereas the original did not, we found that this ratio increased with temporal distance. Participants ascribed the greatest number of positive traits when making assessments about their future self compared to their present and past self, in respective order, possibly reflecting a motive to self-enhance. Although Pronin and Ross (2006) hypothesized this in Study 3, they failed to find support for it. Meanwhile, the present study did, with an ES that detected a signal and was inconsistent and larger than the original. These mixed findings will be further elaborated in the following paragraphs.

Replication

Social Distance

Although smaller than the magnitude of the original effect, we were able to detect a signal for the effect of social distance on trait ascriptions (refer to Table 10 for comparison). One reason for the smaller effect may be due to the small sample size of the original study (refer to the original article analysis in the supplementary). This may have resulted in an inflated effect that may not be representative of the true effect size (Ioannidis, 2008). This is in line with the results of a recent meta-analysis regarding actor-observer asymmetry by Malle (2006), who analyzed 173 published studies on the actor-observer asymmetry in attributions and found much smaller effects ($d = 0.016$ to $d = 0.095$) than anticipated. As such, this replication contributes to the emerging evidence, which may suggest a need for a re-examination of the strength of the effect of social distance on attribution. More specifically, despite the ubiquity of this effect in various textbooks and research, the strength of this effect may not be as strong as would be suggested by the published literature.

Temporal Distance

We were unable to replicate the effect of temporal distance on trait ascriptions. We were unable to detect a signal, and the effect was considerably weaker than in the original (see **Table 5**). We believe that it is unlikely that the failure to replicate this effect resulted from a methodological differences and that the findings may suggest that the effect of temporal distance may be weaker in reality and possibly applies mainly to valenced traits, suggesting a need to reframe the hypotheses for temporal distance.

Although we combined the designs of Studies 1, 2, and 3 into a single experimental design for the current replication, we argue that this does not interfere with the closeness or quality of the replication. Based on our analysis and comparison of the three studies (refer to the corresponding section in the supplementary under 'Comparisons and Deviations'), the designs did not conflict with one another when combined, mostly due to the methodological similarity and between-subjects design. Otherwise, the method of the present replication is very close to the original, as we used the same list of traits as the experimental stimuli and conducted the experiment using a web-based questionnaire. Furthermore, although combining the studies into one may cause concerns in regard to effect size and power, we addressed this through using the safeguard power analysis method (Perugini, Gallucci, & Costantini, 2014), ensuring that the samples for the tests for each of the hypotheses was sufficiently powered.

Hence, given that the effect of social distance demonstrated in a meta-analysis (Malle, 2006) was smaller than initially thought and the similarity between the processes by which social distance and temporal distance are theorized to affect trait judgements via construals, it is possible that the effect of temporal distance is also not as strong as would be suggested by the published literature. Additionally, the findings of the present study suggest that temporal distance does affect trait ascriptions, but only for valenced traits. Nonetheless, future studies or replications will be required to confirm our findings and obtain a more precise estimate of the observed effects for this phenomenon.

Self-Enhancement Hypothesis

Similar to the original, we found that participants ascribed a greater ratio of positive-to-total traits to themselves. In contrast to the original, we found that this ratio increased with temporal distance (refer to Table 10 for comparison). That is, participants seemed to demonstrate a self-serving bias to see themselves as improving over time and developing in increasingly positive ways. Malle (2006) found that the actor-observer asymmetry only emerged for negative events, whereas the opposite occurred for posi-

tive events. However, controlling for valence, this difference disappeared. Thus, this may be taken to indicate that the support for an actor-observer asymmetry in attributions may not be as robust as initially thought and that the documented actor-observer effects in the existing literature may result not from a person-situation distinction but rather from a self-serving bias, or perhaps a different explanation altogether. Our findings must be further tested and confirmed by future studies which can investigate how variations in valence, scenarios, or trait descriptions can influence the actor-observer effect.

Extension

We ran an extension examining the difference in positive versus negative trait attributions between self and other attributions, hypothesizing that participants would ascribe a greater ratio of positive traits when making assessments about themselves compared to their friends out of a motive to self-enhance and see themselves in a positive light. This was based on prior studies which found that people tend to attribute more positive traits during self-appraisal as opposed to other-appraisal out of a motivation to enhance self-worth (e.g., Brown, 1986; Steele, Spencer, & Lynch, 1993). Surprisingly, the results of the current investigation suggest that the opposite may be true. That is, people were more likely to ascribe positive traits when making judgments about their friends compared to when they were assessing themselves.

One possible reason for this unexpected finding is that we had participants make judgments of a close friend who they have known for five years, rather than an acquaintance or stranger. Many of the studies regarding the actor-observer asymmetry have been done in the context of non-intimate relationships (e.g., making judgments about new acquaintances or strangers) rather than on intimate relationships (making judgments of parents or child, close friends, or romantic partners) (Malle, 2006). In this regard, Jones and Nisbett (1971) postulated that relational intimacy functioned as a moderator of actor-observer differences, wherein people making judgments about others with whom they are in an intimate relationship with would demonstrate a less salient difference compared to strangers or acquaintances who they do not know well. As such, future studies can investigate how this effect may vary as a function of relational intimacy: for example, whether participants are asked to make judgments about new acquaintances or strangers instead of close friends.

Implications, Limitations, and Directions for Future Research

Constraints on Generality (COG)

Participants

Since exclusively American participants were recruited using MTurk, there may be concerns regarding the demographic representativeness of the current sample. This has been raised in previous investigations using such samples (e.g., Walters, Christakis, & Wright, 2018, Huff & Tingley, 2015). As such, this may limit the generalizability of the present findings to other populations without these characteristics, and it is uncertain how these findings would apply to non-WEIRD samples (Western, educated, industrialized, rich, democratic; Henrich, Heine, & Norenzayan, 2010) which were not accounted for in the present sample. This is an important limitation, as prior studies (e.g., Choi, Nisbett, & Norenzayan, 1999) have found that the tendency towards dispositional and situational attributions of self versus others vary cross-culturally. More specifically, they found that East Asians tend to demonstrate less correspondence bias than Western samples due to the importance placed on situational context on behaviors in Asian thinking. As such, it is noted that our ability to generalize is limited, and it is recommended that future research explore these potential cross-cultural differences with greater specificity.

Materials/Stimuli

Following Pronin and Ross (2006), we used a list of descriptive trait pairs as the experimental stimuli. Since this was a limited number of traits, it is possible that using a list with a different variety or category of traits may lead to different results, especially because Malle (2006) found that the type of traits (e.g., external, internal, positive, negative) influenced the magnitude of the actor-observer asymmetry in trait judgments. For example, Malle (2006) found that participants showed stronger actor-observer asymmetry in judgment of intimates for external attributions but not internal attributions. For this reason, studies must be careful to include manipulation checks which capture the type of traits used as experimental material.

Procedures

Malle (2006) has shown that research design (between-subject vs. within-subject) had an effect on the difference in trait attributions for self versus others. Differences in judgments of self compared to others only emerged in between-subject designs but not within-subject designs. Since the present study used a between-subject design, it is possible that the observed effects may not occur in a within-subjects design.

Constraints on Theory Generalizability

We observed an effect for social distance and self-enhancement but not for temporal distance, and we concluded mixed support for the findings in the original article. Given the link suggested between the phenomena and these experimental designs and findings, we interpreted this to be in support of the phenomena in this specific context and methodology. We note that our ability to generalize from these findings to other contexts and methodology is limited and implications for theory need to be further elaborated and tested.

Conclusion

Our findings were inconclusive, with mixed results regarding the replicability of Pronin and Ross (2006). We were able to successfully replicate the effects of social distance and self-enhancement on trait attributions. However, we were unable to replicate the central

hypothesis regarding the effect of temporal distance on trait ascriptions in the present replication, suggesting the need for more replications to test our findings and obtain a more precise estimate regarding the effect of this phenomenon.

Note

[1] For the model with total trait ascriptions as the DV, we found support for social distance predicting differences in trait ascriptions, $F(1, 872) = 9.02$, $p = 0.003$, $f = 0.10$, 95% CI [0.05, 0.16], but not temporal distance, $F(2, 872) = 0.24$, $p = 0.791$, $f = 0.02$, 95% CI [0.00, 0.06]. Participants ascribed more traits to their friends than themselves, $p = 0.003$. As for the model with the total number of positive trait ascriptions as the DV, we found that participants' likelihood of ascribing positive traits varied based on both temporal distance, $F(2, 872) = 16.88$, $p < 0.001$, $f = 0.20$, 95% CI [0.14, 0.25], and social distance, $F(1, 872) = 36.20$, $p = 0.003$, $f = 0.20$, 95% CI [0.15, 0.26]. Post hoc comparisons showed differences in the number of positive traits in the future versus past conditions, $p < 0.001$ as well as in the future versus present conditions, $p < 0.001$, but with no support for the present versus past conditions, $p = 0.225$.

Additional File

The additional file for this article can be found as follows:

- **Supplementary materials.** Pronin and Ross (2006) Replication and Extension: Supplementary. DOI: https://doi.org/10.5334/irsp.571.s1

Competing Interests

The authors have no competing interests to declare.

Author Contributions

Nadia conducted the replication as part of her undergraduate thesis in psychology. Gilad was the thesis advisor. He supervised each step in the project, conducted the pre-registrations, and ran data collection. Nadia and Gilad jointly finalized editing the thesis for journal submission.

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Additional Information

The current replication is part of the larger 'mass pre-registered replications in judgment and decision-making' project. The project aims to revisit well-known research findings in the area of judgment and decision making (JDM) and to investigate the replicability of these findings.

Contributor Roles Taxonomy

The table below employs CRediT (Contributor Roles Taxonomy) to identify the contributions and roles of the contributors in the current replication effort. Refer to https://www.casrai.org/credit.html for details and definitions of each of the roles listed below.

Role	Nadia Adelina	Gilad Feldman
Conceptualization		X
Pre-registration	X	X
Data curation	X	
Formal analysis	X	
Funding acquisition		X
Investigation	X	
Pre-registration peer review/verification		X
Data analysis peer review/verification		
Methodology	X	
Project administration		X
Resources		X
Software	X	
Supervision		X
Validation	X	
Visualization	X	
Writing, original draft	X	
Writing, review and editing	X	X

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