



# Visualizing Self: Altruism is (Un)Affected by Field Versus Observer Representations of Self

Shelby E. Weathers<sup>1</sup> · Helena Q. Saven<sup>1</sup> · Coren L. Apicella<sup>1</sup>

Received: 12 March 2024 / Revised: 31 March 2024 / Accepted: 5 April 2024 /

Published online: 11 April 2024

© The Author(s) 2024

## Abstract

**Purpose** This study examines the impact of first-person versus third-person mental visualizations of self on prosocial behavior, building on research that links perspective-taking to differences in moral judgments, agency, and self-awareness. A first-person perspective of self typically enhances feelings of agency, personal responsibility, and empathy, which has been hypothesized to lead to greater helping. However, a third-person perspective of self may heighten self-awareness, potentially leading to a greater focus on reputation management and consequently, helping.

**Methods** In two preregistered experiments we test the impact of perspective taking of self on altruistic behavior. Experiment One ( $n=599$ ) manipulates generalized perspective taking of self during memory recall and assesses its effect on the amount of time individuals engage in a charitable activity. Experiment Two ( $n=271$ ) extends this investigation to explore how targeted perspective taking of self while visualizing a future volunteer activity influences intention to volunteer and actual volunteering.

**Results** Across both experiments we found no evidence of an effect of perspective taking on altruistic behavior.

**Conclusion** Our results contrast with previous research suggesting that differences in mental visualizations of self influence prosocial behaviors. These findings underscore the complexity of this research area and call for a deeper examination of the theoretical frameworks and methodology used in studies.

**Keywords** Altruism · Prosocial behavior · Third-Person perspective · First-Person perspective · Mental imagery

---

✉ Shelby E. Weathers  
seweath@sas.upenn.edu

<sup>1</sup> Department of Psychology, University of Pennsylvania, 3720 Walnut Street, Philadelphia, PA, USA

## Introduction

### Background

When creating a mental image of an event, such as recalling a memory or visualizing a hypothetical situation, people can include themselves in the mental image in different ways. A first-person perspective of the self involves looking out at the world from within one's body, while a third-person perspective mimics how an observer might see the event and includes the whole self in the image. The phenomenological distinction between “field” (first-person) and “observer” (third-person) mental imagery dates back to Freud and his contemporaries in their discussions of memory recall (Henri & Henri, 1896; Freud, 1899). Despite this lengthy history, empirical research on self-visualization began only fifty years ago, revealing important relationships between mental imagery, emotion, and cognition. Most recently, researchers have examined how self-visualization might influence prosocial cognition and behavior, including feelings of personal responsibility (e.g., Tausen et al., 2018), moral judgments (e.g., Saine et al., 2021), and prosocial intentions (e.g., Crisp & Husnu, 2011). While some of the research on the correlates and effects of visual perspective have yielded inconsistent findings and have some methodological limitations, collectively, the current evidence suggests that self-visualization may play a role in influencing prosocial behaviors, thus warranting further investigation.

Most people report recalling autobiographical memories from both visual perspectives (Nigro & Neisser, 1983; Robinson & Swanson, 1993). Some studies indicate a slight predominance of first-person memories (Nigro & Neisser, 1983; Lorenz & Neisser, 1985; D'Argembeau et al., 2003), while others report a greater tendency for third-person memory recall (McDermott et al., 2016; Rice & Rubin, 2009). Inward reflections also contain a mix of both perspectives. During a mind-wandering task, Christian et al. (2013) found that individuals experience an equal mix of both perspectives. For imagined future events (i.e., episodic future thought), both perspectives are employed, with some research suggesting a higher prevalence of using the third-person perspective (McDermott et al., 2016). While a predilection for mentalizing in one perspective may exist, individuals can usually control which perspective they adopt, especially after receiving instruction (e.g., Rice & Rubin, 2009).

Determining the frequency of each perspective is complicated by the non-mutually exclusive nature of the two perspectives (Rice & Rubin, 2009). Additionally, contextual factors, such as temporal distance, can influence the rate of using each perspective. For example, early studies established a tendency for more recent memories to be from a first-person perspective (Nigro & Neisser, 1983; Lorenz & Neisser, 1985), a finding which has been replicated in more recent work (Akhtar et al., 2017; D'Argembeau & Van der Linden, 2004; Pronin & Ross, 2006; Rice & Rubin, 2009) and holds not only for memories, but also for visualizations of the future (D'Argembeau & Van der Linden, 2004, 2012; Macrae et al., 2016; Pronin & Ross, 2006).

Gender, cultural, and individual differences in perspective taking may also exist. Across two studies with large samples, Rice and Rubin (2009) found that women, compared to men, were more likely to recall memories from the third-person. Other

studies, often involving smaller samples (e.g., Ayduk & Kross, 2010) have not found gender differences, although contextual factors regarding the memory may contribute to the inconsistent findings (e.g., Huebner & Fredrickson, 1999). Cohen and Gunz (2002) predicted that individuals from collectivist societies would adopt a third-person perspective more frequently, because they tend to be more concerned with how others perceive them, requiring them to consider their actions from an observer's standpoint. The researchers found that Asian students studying at a Canadian university were more likely to have third-person memories compared to native North American students. However, this difference was evident only for memories in which the participant was the center of others' attention. Other research involving online participants has found that individuals from Eastern nations are more likely to adopt a third-person perspective when letting their mind wander (Christian et al., 2013). Congruent with this, third-person memories are more common in situations that involve greater self-awareness and social anxiety, such as public speaking (Nigro & Neisser, 1983). And, publicly self-conscious individuals tend to remember more of their social interactions in the third-person (Robinson & Swanson, 1993).

If the mental perspective one adopts is influenced by concerns of how one is perceived by others, it raises intriguing questions about the potential impact of deliberately manipulating one's visual perspective on self-perception, feelings of personal responsibility, and degree of social awareness – all factors which could influence prosocial behavior. Indeed, a sizable literature suggests that intentionally manipulating how events are visualized can impact the cognitive and emotional construal of those events.

Broadly, first-person perspective-taking has been associated with greater emotional closeness, detail, and internal awareness (for review, Niese et al., 2022). Memories naturally recalled from the first-person are rated higher on vividness, sensory detail, emotional intensity, and memory clarity (Sutin & Robins, 2010). Likewise, first-person visualizations of the future are also more vivid (D'Argembeau & Van der Linden, 2012). Instructing participants to focus on personal feelings results in more first-person memories while focusing on objective circumstances of events produces more third-person memories (Nigro & Neisser, 1983). Moreover, positive and negative memories are more often experienced in the first-person, while neutral memories are more common in the third-person (D'Argembeau et al., 2003). Finally, in experiments where participants are instructed to describe the same set of actions performed in a laboratory setting, those instructed to adopt a third-person perspective provide fewer details about their internal thoughts, emotions, and physical sensations, compared to those instructed to recall the actions from a first-person perspective (Eich et al., 2009). Congruent with this, first-person memories are associated with greater activity in brain regions associated with interoception-based awareness, somatic-motor activity, and arousal (Eich et al., 2009).

### **Perspective-Taking and Prosocial Behavior**

It stands to reason that a third-person perspective may allow people to become more aware of how they appear to others (Cohen et al., 2002; Macrae et al., 2016), potentially leading to an increased emphasis on reputation management, and consequently,

helping. Research suggests that when participants are instructed to recall memories in the third-person, those recollections contain richer “external” content, including self-descriptions of appearance and actions, which are more salient to observers (Eich et al., 2009). Interestingly, manipulating the perspective one adopts during recall can also influence the type of attributions individuals make about their own actions (Frank & Gilovich, 1989; Storms, 1973). When instructed to recall memories of self from a third-person perspective, individuals tend to make more dispositional attributions, akin to the attributions people make when observing others (Frank & Gilovich, 1989; Storms, 1973). However, when recalling a memory from a first-person perspective, individuals tend to make fewer dispositional inferences about themselves, possibly because they are reliving and experiencing the effects of the situation from within. This shift in causal attribution underscores how a third-person perspective increases awareness of self in relation to others (Frank & Gilovich, 1989) and provides individuals with valuable insight about how others may interpret their actions.

To the extent that third-person perspective taking reduces egocentrism and induces a heightened sense of social observation and accountability, it may too have appreciable effects on prosocial behavior. Evolutionary psychology has long highlighted the significance of reputation management in human cooperation, emphasizing that individuals are naturally motivated to uphold positive reputations in order to reap social rewards, such as attracting valuable partners and avoiding social consequences, like ostracism (for review, Wu, Balliet, and van Lange, 2016). While there is an extensive literature suggesting that social visibility versus anonymity increases cooperation (e.g., Bereczkei et al., 2007), other literature suggests that even subtle cues of being watched can lead to greater levels of cooperation. For instance, eyespots on a computer, known as the “watching eyes effect” can enhance generosity in a dictator game (Haley & Fessler, 2005). This effect extends to real-world scenarios, fostering greater contributions for drinks and charities (Bateson et al., 2006; Powell et al., 2012), curbing littering in cafeterias (Ernst-Jones, Nettle, & Bateson, 2012), deterring bicycle theft (Nettle et al., 2011) and promoting pedestrian adherence to traffic regulations (Manesi et al., 2016). Just like the watching eyes effect, taking an observer’s perspective of self could enhance perceptions of social visibility.

Abstract thinking encouraged by a third-person perspective may also facilitate a greater appreciation of social context, including social rules and expectations as well as judgments from others. Thus, taking a third-person perspective could help facilitate behaviors motivated by social responsibility. In support of this, it has been shown that visualizing going to the polls from a third-person perspective increases intention to vote, as well as self-reported voting behavior (Libby et al., 2007). Additionally, in a small study involving 60 participants, Crisp and Husnu (2011) found that imagining contact with a member of a stigmatized group from a third-person perspective produced stronger intentions to engage with the group member in the future compared to a first-person perspective.

Engaging in a third-person perspective may also encourage more abstract evaluations by reducing the focus on concrete details. This shift is thought to weaken the influence of contextual information when making moral judgments and encourage a more general application of moral rules to scenarios. Researchers have explored this possibility by comparing moral wrongness ratings for transgressions between individ-

uals who were instructed to imagine themselves committing the transgression from a first-person perspective versus a third-person perspective. Those who imagined their immoral actions in the third-person tended to rate them as more wrong (Agerström et al., 2013; Saine et al., 2021). Similarly, when participants were instructed to read vignettes of moral transgressions and either focus on their own thoughts and feelings or to take the perspective of someone they know, participants who took the perspective of another person rated the scenarios as more morally wrong (Eyal et al., 2008). Taken together, adopting a third-person perspective may enhance prosocial inclinations by both amplifying perceptions of social visibility and prioritizing the consideration of moral principles over egocentric concerns.

There may be reasons for expecting first-person perspectives to foster increased prosocial behavior as well. Because first-person perspectives tend to be more vivid, concrete, and are imbued with heightened emotional and physiological arousal (Sutin & Robins, 2010; D'Argembeau & Van der Linden, 2012), they might evoke a stronger empathetic response which could, in turn, lead to increased cooperation. Indeed, there is an extensive literature linking empathy to various prosocial behaviors (for review, Yin & Wang, 2023). For instance, an empathy induction has been shown to increase altruistic behavior in a dictator game, and experienced empathy predicted over 40% of the change in cooperative behavior (Klimecki et al., 2016).

In addition, Tausen et al. (2018) proposed that because sensorimotor perception helps give rise to an individual's sense of agency, a first-person perspective may influence feelings of personal responsibility for one's actions. They tested the hypothesis in two small samples ( $n=137$  and  $n=64$ ), manipulating perspective-taking and event valence in hypothetical scenarios. Judgments of personal responsibility were higher in the first-person condition, regardless of whether the scenario had a positive or negative outcome (Tausen et al., 2018). This effect on agency and personal responsibility might impact intentions and actions. Rennie et al. (2014) demonstrated that first-person visualizations of engaging in a health behavior after reading an informational message increased intentions to engage in the behavior more than third-person visualizations. Similarly, in a sample of 113 participants, Brown and de Place (2022) found that first-person visualizations of life after being vaccinated for COVID-19 were more effective in increasing intentions to get the vaccine compared to third-person visualizations. Alternatively, Rennie and colleagues (2016) found that third-person visualizations were more effective in increasing intentions and actual engagement for simple rather complex health behaviors. This departure from the previous work may be due to the effects of a third-person perspective in reducing focus on concrete details, which could inhibit engagement in more complex behavior that requires planning. However, it's worth noting that the study which had a participant pool of 150, might have lacked sufficient statistical power for identifying small effects in interactions. In another study, Zhang and colleagues (2021) used a  $2 \times 2$  design with a sample of 271 participants to investigate the interaction between visual perspective and thought focus. They found that third-person visualization was more effective in increasing intentions to recycle, but only when the visualization focused on the positive outcomes of recycling behavior. When the visualization focused on the actual process of recycling, a first-person perspective was more effective (Zhang et al., 2021).

The existing body of research indicates that a third-person perspective may enhance prosocial behaviors by heightening the sense of being observed and evaluated socially, and by shifting attention from self-centered issues to more general societal concerns. On the other hand, a first-person perspective could increase prosocial actions by intensifying feelings of personal agency, responsibility, and empathy. Here we explore how visual perspective-taking of self influences cooperative behavior. The current research stands out for its larger sample sizes, preregistration, and focus on actual cooperative behaviors rather than intentions. We conduct two experiments: the first explores whether a general first or third-person visualizations of self can enhance prosocial actions. Here, participants recall events from the previous day from one of the two perspectives. The second experiment takes a narrower approach, examining whether visualizing a specific future cooperative task from either a first or third-person perspective affects cooperative intentions and actions in that task. Finally, we also test whether any effects of visual perspective on altruistic behavior are mediated by self-construal (i.e., the extent to which an individual sees themselves as interdependent with others). It is possible that one's perspective of the self may influence the relative salience of social connectedness, and thus emphasize cooperative motivation. Self-construal has been shown to predict engagement in altruistic behaviors such as volunteering and donation to charity (Skarmees & Shabbir, 2011; Yong Seo & Scammon, 2014).

## Study 1

### Materials and Methods

#### Preregistration and Data Availability Statement

This study was preregistered on Open Science Framework prior to any data being collected. Preregistration included desired sample size, exclusion criteria, measured variables, hypotheses, and planned analyses. Unless explicitly stated, we conformed to all aspects of the preregistration. Sample size was determined based on an a priori power analysis conducted to detect an effect size of  $d=0.3$  with 95% power at  $\alpha=0.05$ . Data and analysis code are publicly available on the Open Science Framework. All measures, manipulations, and exclusions are disclosed in the manuscript or Online Resources. Figures were generated and analyses were conducted using R statistical software version 4.2.2, RStudio version 2023.09.1+494.

#### Participants

Responses were collected from 693 participants via Prolific. The sample was balanced by gender. Prolific users were excluded from participation if they were not fluent in English or were living outside of the United States. A total of 94 participants were removed from analysis for completing less than 50% of the items, completing the study in under five minutes, or entering unintelligible text responses. The final sample comprised 599 participants, with 302 in the first-person condition and 297 in

the third-person condition. Of these, 50.3% were women; 5 identified as non-binary, and 2 chose not to disclose gender. A majority of the sample, 78.8%, identified as White, 7.5% as African American, 4.5% as Asian, 2.8% as Hispanic or Latino/a, 0.3% as Native American or Indigenous, and 6.0% as Mixed Race/Other. The mean age was 42.3 years ( $SD=13.6$  years). The median income was \$50,000 - \$99,999 and the median educational attainment level was a bachelor's degree. Finally, 97.6% of the sample reported being raised in the United States.

## Procedures

The experiment was advertised on Prolific as a study on memory recall. Prospective participants were informed that they would be asked to recall a memory, write a short narrative of the memory, and respond to a few survey questions. Those who chose to participate received a Qualtrics survey link. After providing consent, participants filled out demographic information including gender, age, ethnicity, income, level of education, and whether they were raised in the United States.

**Visualization Task** Following the demographic questionnaire, all participants received instructions for a task that required them to visualize the events of the previous day. Participants were randomly assigned to one of two conditions. In the first-person condition, participants were instructed to use a first-person perspective where scenes are visualized “from within your body looking out”. Participants in the third-person condition were asked to use a third-person perspective where the perspective was described as picturing each scene, “from outside your body, including yourself in the mental image”. Both sets of instructions included prompts to encourage participants to visualize the entire day, as well as photographs depicting examples of the visual perspective corresponding to their assigned condition (see Online Resource 1 for full set of instructions). Participants had to spend at least 90 s on the task but were informed that they could take as much time as needed.

Next, participants wrote a narrative of the day they visualized using pronouns that matched the perspective assigned to them, i.e., “I”, “my”, “we”, in the first-person condition and “she/her”, “he/him”, “they/them” in the third-person condition. Participants in the third-person condition were also permitted to refer to themselves by their first name. In both conditions, participants were instructed to enter a response with a minimum of 1,200 characters.

**Visualization Rating Scales** Following the writing task, participants responded to several questions about the day that they just recalled. Using Likert-scales, they rated the extent to which the events of the day were typical for their daily life (0 = “very unusual”, 3 = “very typical”), the extent to which the day was generally positive or negative for them (0 = “extremely negative”, 4 = “extremely positive”), the extent to which the day involved interaction with others (“lots, some, or no interaction with others”), and the vividness of their visualizations (0 = “not vivid at all”, 4 = “extremely vivid”). Participants also identified emotions experienced during the visualization from a provided list (see Online Resource 2 for list of emotions) and

responded “yes” or “no” as to whether the memory involved interactions with family, friends, or strangers.

**Altruism Measure** A brief cover story was used to mask the true intent of the altruism measure, helping to ensure participants remained unaware of the study’s actual focus. After responding to the questions regarding their visualized day, participants read the following message:

“You are almost finished with the study, thank you for your participation thus far. Before we wrap up the study, we would like to request an additional moment of your time.

Our research group is participating in a winter charity campaign for the Children’s Hospital of Philadelphia (CHOP). A donor has pledged to contribute \$0.10 for every view on select promotional videos. By spending only 30 seconds per video, you can help us raise money to donate to CHOP. If everyone who takes our survey chooses to watch all of the videos, we estimate that together we will raise \$600 for CHOP. You are not required to participate in our charity campaign to earn credit for completing this study. You may choose to watch as many or as few videos as you would like.”

They were then asked, “Are you willing to spend 30 seconds watching a promotional video to raise money for our charity campaign?”. If participants chose not to watch the video, they continued directly with the study. If participants chose to watch the video, they were presented with the opportunity to watch another 30-second video, or to return to the study. This choice was presented repeatedly for up to ten videos before they were automatically redirected back to the study. The total number of videos that participants chose to watch (0–10) served as a measure of altruistic behavior, as they were informed that they were not required to participate in the charity campaign to receive credit for completing the study, nor would they receive any additional compensation for their time. While we used a cover story, all money earned (\$) was donated to CHOP.

**Manipulation Checks and Natural Perspective Taking** The section following the charity campaign message was the same, regardless of whether participants chose to watch any videos. At the beginning of this section, participants were presented with a reminder of the narrative they wrote earlier in the study. As a manipulation check, participants were asked to indicate the extent to which they saw the events in the recall task from a first- or third-person perspective (0=completely first-person; 4=completely third-person). Participants also rated the difficulty of using the assigned perspective on a 5-point Likert scale, with a higher rating corresponding to



more difficulty. They were also asked to indicate which perspective they generally take when naturally recalling a memory.

**Self-Construal** In the final section of the study, participants responded to a scale that measured self-construal. This measure consists of a 7-item subscale measuring independent self-construal, as well as a 10-item subscale measuring interdependent self-construal (Hashimoto & Yamagishi, 2013). Ratings for each item on the subscales are averaged separately to form independence and interdependence scores. The independence score is subtracted from the interdependence score to calculate an overall self-construal score. A higher overall score indicates a more interdependent self-construal. Participants also rated the extent to which they agree with the statements, “I consider myself to be an altruistic/generous/good person”, on a 5-point Likert scale (“strongly agree” to “strongly disagree”).

At the end of the study, participants were debriefed. They were informed of the true purpose of the charity campaign task and told that any money raised by participants who watched the videos would be donated to CHOP at the conclusion of the study. Based on the total number of videos watched by participants, the final donation to CHOP amounted to \$130. The study took approximately 15 min to complete, and each participant was paid \$3.00 for participation.

## Results

### Manipulation and Balance Checks

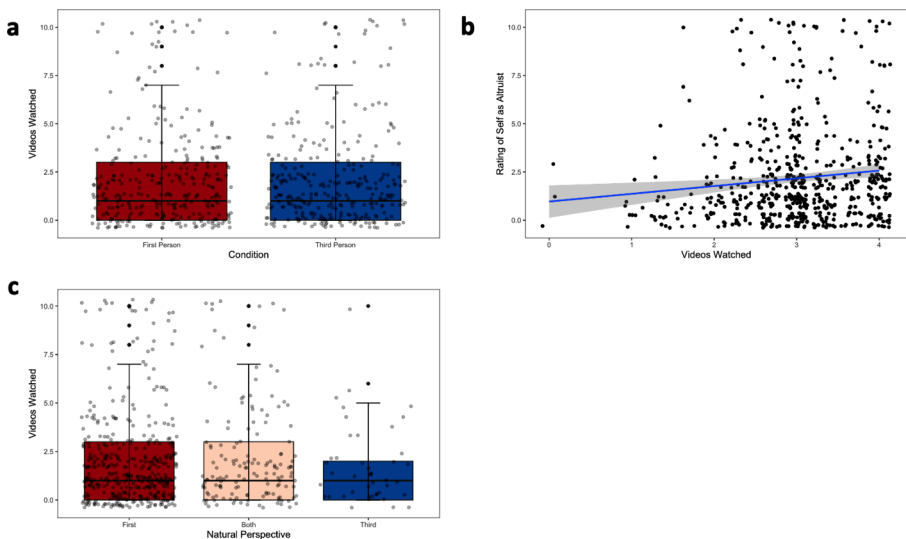
Shapiro-Wilk tests indicated that the manipulation check measures (perspective used in the visualization task; difficulty of using assigned perspective) were not normally distributed ( $p < 0.001$  for both measures). As a result, we deviated from the preregistration to use nonparametric tests (i.e., Mann-Whitney tests) to compare the ratings between groups. A significant difference was found between the perspectives used by each group,  $W = 4217.50$ ,  $p < 0.001$ ,  $r = 0.83$ , with participants in the first-person condition being more likely to report using a first-person perspective in the task ( $Med = 0$ ,  $IQR = 0$ ) and participants in the third-person condition being more likely to report using a third-person perspective in the task ( $Med = 3$ ,  $IQR = 2$ ). Across all participants, the level of difficulty was low ( $Med = 2$ ,  $IQR = 4$ ). There was a difference in the average rating of difficulty between conditions,  $W = 38,579$ ,  $p < 0.01$ ,  $r = 0.13$ . Participants in the third-person condition rated difficulty higher ( $Med = 2$ ,  $IQR = 4$ ) than those in the first-person condition ( $Med = 0$ ,  $IQR = 4$ ). Further, there was a slight difference in ratings of difficulty between participants whose natural perspective during recall did or did not match the perspective assigned for the visualization task,  $W = 36,734$ ,  $p = 0.03$ ,  $r = 0.09$ . Participants whose natural perspective matched their assigned perspective rated the difficulty of using the assigned perspective lower ( $Med = 2$ ,  $IQR = 4$ ,  $Mean = 1.81$ ,  $SD = 1.87$ ) than those whose natural and assigned perspective did not match ( $Med = 2$ ,  $IQR = 4$ ,  $Mean = 2.16$ ,  $SD = 1.66$ ). Still, the overall difficulty

for both groups was low since a rating of 2 corresponds to “neither easy nor difficult”. Finally, a linear regression found no significant relationship between vividness ratings and whether participants’ natural perspective did or did not match the perspective assigned for the visualization task,  $b = -0.07$ ,  $SE = 0.07$ ,  $p = 0.28$ .

A t-test indicated no significant difference in the mean age between conditions,  $t(598) = 1.41$ ,  $p = 0.16$ ,  $d = 0.12$ . Chi-square tests determined that there were no significant associations between condition and any of the categorical demographic variables including gender, ethnicity, income, education, and whether the participant was raised in the United States (Online Resource 3).

## Altruistic Behavior

The median number of charity videos that participants watched was 1 ( $IQR = 3$ ,  $Range = 0–10$ ). A Shapiro-Wilk test indicated that the number of charity videos watched was not normally distributed ( $p < 0.001$ ), and again we opted to diverge from the preregistration by using Mann-Whitney tests to compare the number of charity videos watched by participants in each condition. There was no significant difference in the number of videos watched in the first-person condition ( $Med = 1$ ,  $IQR = 3$ ) compared to the third-person condition ( $Med = 1$ ,  $IQR = 3$ ),  $W = 43,838$ ,  $p = 0.63$ ,  $r = 0.02$ ; Fig. 1a. The 95% confidence interval indicates an extremely close range for the difference in means between the groups ( $-0.00004$ ,  $0.00004$ ), suggesting that any difference between the conditions is likely negligible. Our final sample size provided



**Fig. 1** (a) Boxplot presenting the total number of charity videos participants watched, categorized by condition. Boxplot shows median values, represented by the bold line and the interquartile range, indicated by the span of the box. (b) Scatterplot illustrating the relationship between the number of charity videos participants watched and their rating of themselves as an altruistic/generous/good person. The gray area depicts a confidence interval around the line of best fit. (c) Boxplot presenting the total number of charity videos participants watched, categorized by the perspective they naturally use to recall events

80% power to detect an effect size of  $d=0.2$  or greater in an independent-samples Mann-Whitney test at  $\alpha = 0.05$ .

To explore the robustness of this null result, a backward stepwise regression analysis was performed. We opted to run a Poisson regression rather than the linear regression planned in the preregistration as it is a better option to model the non-normal essay count data. The aim was to assess whether the null findings were sensitive to the inclusion of potential confounders in the model. Predictor variables included condition, gender, ethnicity, education, income, age, whether an individual was raised in the United States, vividness rating of the events recalled, the extent to which the events recalled were typical of daily life, were generally positive or negative, and generally involved social interaction, and specifically whether the events recalled involved interaction with family, friends, or strangers. Notably, the condition variable did not emerge as a significant predictor in the regression analysis further supporting the null result obtained from the initial Mann-Whitney test. The final model retained affect, education, vividness, ethnicity, age, and the extent to which the events recalled generally involved social interaction, and specifically with friends or strangers (Online Resource 4). It is important to interpret these findings with caution. The sample size for certain ethnic categories was small. Additionally, these findings were not predicted a priori and emerged in the context of multiple comparisons. Thus, the practical significance of these findings is limited and should not detract from the primary conclusion: there was no effect of condition on our measure of altruism.

## Natural Perspective

Approximately 67% of participants indicated that they generally use a first-person perspective when naturally recalling memories. Only about 7% indicated that they generally use a third-person perspective, and about 25% indicated that they use both a first and third-person perspective equally.

We ran a Kruskal-Wallis test to check for an association between the three natural perspective groups and altruistic behavior. There was no significant association between natural perspective and the number of videos watched,  $\chi^2=1.69$ ,  $df=2$ ,  $p=0.43$ ,  $\varepsilon^2<0.001$ ; Fig. 1c. A Kruskal-Wallis test indicated that there was an association between natural perspective and the participant's ratings of vividness of their visualization,  $\chi^2=7.68$ ,  $df=2$ ,  $p=0.02$ ,  $\varepsilon^2=0.01$ . Vividness was rated the highest by participants who naturally use first-person (Med=3, IQR=1, Mean=3.14, SD=0.76), slightly lower for those that use first and third person equally (Med=3, IQR=1, Mean=3.01, SD=0.83), and lowest for those that use third person (Med=3, IQR=0.25, Mean=2.82, SD=0.76). Although different tests were planned in the preregistration to analyze the relationship of natural perspective to altruism and vividness, a Kruskal-Wallis test was determined to be the more appropriate test in both cases.

We conducted chi-square tests to determine whether there was an association between any of the categorical demographic variables and the perspective that individuals generally use when recalling a memory. There was no association between natural perspective and gender ( $\chi^2=4.01$ ,  $df=4$ ,  $p=0.41$ ), income ( $\chi^2=7.86$ ,  $df=10$ ,  $p=0.64$ ), ethnicity ( $\chi^2=10.52$ ,  $df=10$ ,  $p=0.40$ ), or whether an individual was raised

in the United States ( $\chi^2=1.05$ ,  $df=2$ ,  $p=0.59$ ). A one-way ANOVA determined that there was no significant association between age and natural perspective,  $F(2, 596)=2.19$ ,  $p=0.11$ .

### Self-Construal

We hypothesized that participants in the third-person condition would identify more closely with an interdependent self-construal, whereas those in the first-person condition would identify more closely with an independent self-construal. A linear regression indicated that condition was not a significant predictor of self-construal,  $b=0.07$ ,  $SE=0.08$ ,  $p=0.39$ .

We hypothesized that individuals who spent more time watching the charity videos would be more likely to show high agreement with the statements “I consider myself to be an altruistic/generous/good person”. We calculated a Spearman correlation to test the relationship between altruistic behavior and ratings of the self on these characteristics. There was a significant positive correlation between the number of videos watched and one’s ratings of the self as an altruistic/generous/good person,  $r=0.11$ ,  $p<0.01$ ; Fig. 1b. A Spearman correlation between self-construal and ratings of the self as an altruistic/generous/good person was also significant,  $r = -0.09$ ,  $p=0.03$ . A more independent self-construal was correlated with a higher rating of the self as an altruistic/generous/good person.

## Study 2

### Materials and methods

#### Preregistration and Data Availability Statement

This study was preregistered on Open Science Framework prior to data collection. Preregistration included desired sample size, exclusion criteria, measured variables, hypotheses, and planned analyses. Unless explicitly stated, we conformed to all aspects of the preregistration. Sample size was determined based on an a priori power analysis conducted to detect an effect size of  $d=0.4$  with 90% power at  $\alpha=0.05$ . Data and analysis code are publicly available on the Open Science Framework. All measures, manipulations, and exclusions are disclosed in the manuscript or Online Resources. Figures were generated and analyses were conducted using R statistical software version 4.2.2, RStudio version 2023.09.1+494.

### Participants

Responses were collected from 293 undergraduates at the University of Pennsylvania via SONA systems. SONA users were excluded from participation in the study if they were not fluent in English or were under the age of 18. Twenty two participants were removed from analysis for failing to complete at least 50% of the measures. The final sample consisted of 271 participants (141 participants in the first-person condition

and 130 participants in the third-person condition). The sample was 70.48% female, and one participant did not disclose their gender. The median age was 20 years old. The sample was ethnically diverse, with 35.4% of the sample identifying as White, 35.8% as Asian, 12.9% as Hispanic or Latino/a, 8.5% as African American, 4.8% as Middle Eastern, and 2.2% as Mixed Race/Other. Additionally, 23.61% of the sample identified as a first-generation student. The median household income was \$150,000 - \$199,999.

## Procedures

The experiment was advertised as a study about attitudes toward volunteer-based tutoring programs that could be implemented at the participants' school. This description was intended to misdirect participants about the focus of the research in order to avoid demand characteristics. Participants were informed that the study would involve completing a short visualization task about the tutoring program followed by several survey questions. Those who chose to participate were provided with a link to a Qualtrics survey. After providing consent, participants were asked to report demographic information including gender, age, ethnicity, income, first-generation student status, and year in school. As described below, we used a brief cover story to avoid demand characteristics and elicit genuine altruistic behavior.

**Behavior Intention** Participants were asked to read the following description of a hypothetical volunteer program:

Imagine that the writing center at Penn is offering a new program that pairs Penn undergraduates with students from local high schools who are seeking support in writing their college application essay. The program serves low income high school students who would be the first in their family to attend college. The role of Penn undergraduates is to offer advice on the application process and provide written feedback on a student's essay. The program operates on a volunteer basis, and while undergraduate volunteers do not receive payment or course/internship credit, they have the opportunity to help a student in need.

Before and after the treatment (visualization task - described below), participants rated their willingness to volunteer in the program on a 5-point Likert scale ("extremely likely" to "extremely unlikely"). We calculate the change in volunteer intention as the difference in these scores pre-and post-treatment.

**Visualization Task** Participants were randomized into one of two conditions for a visualization task where they were asked to imagine themselves volunteering in the program described in the previous section. They were guided through this visualization with various prompts (see Online Resource 5 for full task instructions). In one condition, the instructions for the task asked the participant to visualize the scenario from a first-person perspective, and in the other condition the instructions asked the participant to use a third-person perspective. After engaging in the visualization task,

participants were asked to again rate the likelihood that they would participate in this program if it were to exist at their university.

**Self-Construal** In the next section, participants responded to the same self-construal scale used in Study 1 and were asked to rate the extent to which they agree with the statements, “I consider myself to be an altruistic/generous/good person”, on a 5-point Likert scale (“strongly agree” to “strongly disagree”).

**Behavior Commitment** Participants were then presented with the following message explaining an opportunity to immediately volunteer for a similar program by providing feedback on student college application essays:

“Our research lab has partnered with a Philadelphia-based nonprofit to assist in the development of a program very similar to the one you were asked to envision. Ultimately, the goal of this program is to expand access to higher education for low income and first-generation youth in the Philadelphia public school system.

As part of the development of this program, we are collecting data on the type of feedback that undergraduate students are able to provide on college application essays.

We are looking for undergraduate students to read short excerpts from college application essays and answer a few questions about the paragraph they read. You are not required to participate in this activity to receive SONA credit for completing this study, and you will not receive additional credit if you decide to participate. This is voluntary. However, your participation would be a major contribution to the success of the program.”

After reading this message, participants were asked to indicate how many essay excerpts they would be willing to review (up to 5). They had the option of selecting “0” to skip the task. Because we were only interested in the amount of time participants were willing to spend volunteering for this task and not in the essay feedback itself, participants did not actually review any essay excerpts regardless of the number that they indicated on this item. However, when selecting their response, participants were under the impression that they were committing to review these excerpts immediately after completing the survey measures.

**Manipulation Checks and Natural Perspective Taking** As a manipulation check, participants were asked to indicate the extent to which they visualized the scenario from a first- or third-person perspective (0=completely first-person; 4=completely third-person). Participants were also asked to rate the difficulty of visualizing the scenario from the assigned perspective (0=extremely easy; 4=extremely difficult), as well as the vividness of their visualization (0=not vivid at all; 4=extremely vivid). Finally,

participants were asked to indicate which perspective they naturally take when visualizing the future.

At the end of the study, participants were debriefed. They were informed about the true purpose of the request to read essay excerpts and the true focus of the study. The study took approximately 15 min to complete, and participants earned course credits for participation.

## Results

### Manipulation and Balance Checks

Shapiro-Wilk tests indicated that the manipulation check, difficulty, vividness, and age measures were not normally distributed ( $p < 0.001$  for all measures). Consequently, due to this non-normality, we deviated from our preregistration plan and opted for equivalent nonparametric (i.e., Mann-Whitney) tests to compare the ratings between groups. To test the effectiveness of the manipulation, we compared participant ratings of the perspective they used in the visualization task and reported difficulty using the assigned perspective between conditions. A significant difference was found between the perspectives used by each group in the intended direction,  $W = 6722.5$ ,  $p < 0.001$ ,  $r = 0.24$ . However, the median ratings in both groups were close, with a median rating of 1 (IQR = 1) corresponding to “mostly first-person” in the first-person condition, and a median rating of 2 (IQR = 2) corresponding to “equally first and third person” in the third-person condition.

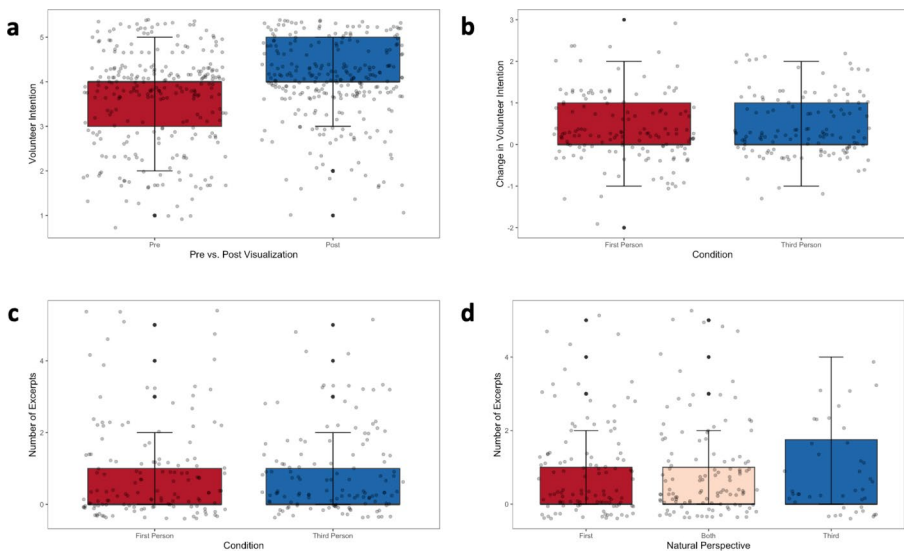
Across all participants, the median rating of difficulty corresponded to “somewhat easy” ( $Med = 1$ ,  $IQR = 1$ ). There was a small difference in the rating of difficulty using the assigned perspective between conditions,  $W = 7698.5$ ,  $p = 0.02$ ,  $r = 0.14$ , with participants in the third-person condition rating difficulty slightly higher ( $Med = 1$ ,  $IQR = 1.75$ ,  $Mean = 1.54$ ,  $SD = 1.08$ ) than those in the first-person condition ( $Med = 1$ ,  $IQR = 1$ ,  $Mean = 1.21$ ,  $SD = 0.92$ ). There was no significant difference in ratings of difficulty between participants whose natural perspective when visualizing the future did or did not match the perspective assigned for the visualization task,  $W = 6256$ ,  $p = 0.08$ ,  $r = 0.11$ . Participants were also asked to rate the vividness of their visualization. A linear regression found no significant relationship between vividness ratings and whether participants’ natural perspective did or did not match the perspective assigned for the visualization task,  $b = -0.11$ ,  $SE = 0.11$ ,  $p = 0.36$ .

A Mann-Whitney test indicated no significant difference in the mean age between conditions,  $W = 9465.5$ ,  $p = 0.63$ ,  $r = 0.03$ . Chi-square tests determined that there were no significant associations between conditions and various categorical demographic variables, including gender, ethnicity, household income, first-gen status, and class year (Online Resource 6).

## Altruistic Behavior Intention and Commitment

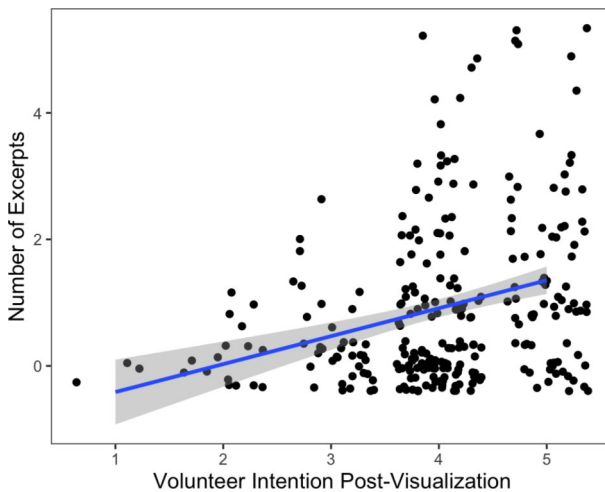
Participants rated their likelihood of joining the volunteer program pre- and post-visualization. We predicted an increase in volunteer intention following the visualization task in both conditions. Shapiro-Wilk tests indicated a non-normal distribution for both pre-and post-visualizations ( $p < 0.001$ ). Consequently, we conducted a Wilcoxon two-sample paired test for comparison. In support of our hypothesis, there was a significant increase from pre- to post-visualization volunteer intention,  $V = 970.5$ ,  $p < 0.001$ ,  $r = 0.45$ ; Fig. 2a. Despite identical medians ( $Med = 4$ ,  $IQR = 1$ ), the distributions of pre-visualization ( $Mean = 3.62$ ,  $SD = 1.07$ ) and post-visualization ( $Mean = 4.00$ ,  $SD = 0.87$ ) volunteer intention do differ. We also hypothesized that post-visualization volunteer intention would be correlated with volunteer commitment (the number of essay excerpts that a participant volunteers to provide feedback on). A Spearman correlation between post-visualization volunteer intention and volunteer commitment was significant,  $r = 0.34$ ,  $p < 0.001$ ; Fig. 3.

We hypothesized that the change in volunteer intention would be more pronounced in the third-person condition than the first-person condition. However, a Mann-Whitney test revealed no difference in change in volunteer intention between conditions,  $W = 8655$ ,  $p = 0.38$ ,  $r = 0.05$ ; Fig. 2b. Similarly, no significant difference was found in the number of excerpts participants agreed to review between the first-person ( $Med = 0$ ,  $IQR = 1$ ) and third-person ( $Med = 0$ ,  $IQR = 1$ ) conditions,  $W = 9126$ ,  $p = 0.95$ ,



**Fig. 2** Boxplot comparisons of altruism measures. Each boxplot shows median values, represented by the bold line and the interquartile range, indicated by the span of the box. **(a)** Presents the distribution of participants' likelihood to participate in the volunteer program, comparing responses before and after the visualization task. **(b)** Presents change in volunteer intention, categorized by condition. **(c)** Presents the total count of essay excerpts that participants volunteered to review, categorized by condition. **(d)** Presents the total count of essay excerpts that participants volunteered to review, categorized by the perspective they naturally use to imagine future events





**Fig. 3** Scatterplot illustrating the relationship between participants' post-visualization ratings of their intention to volunteer and the total number of essay excerpts they volunteered to review. The gray area depicts a confidence interval around the line of best fit

$r < 0.001$ ; Fig. 2c. Our final sample size provided 80% power to detect an effect size of  $d = 0.3$  or greater in an independent-samples Mann-Whitney test at  $\alpha = 0.05$ .

There was no significant difference between white and non-white participants in post-visualization volunteer intention,  $W = 8649.5$ ,  $p = 0.60$ ,  $r = 0.03$ , or volunteer commitment,  $W = 8609.5$ ,  $p = 0.65$ ,  $r = 0.03$ . There was no association between age and post-visualization volunteer intention,  $r = -0.06$ ,  $p = 0.33$ , or volunteer commitment,  $r = -0.01$ ,  $p = 0.93$ . Although including a test for an association between post-visualization volunteer intention and gender was overlooked in the preregistration, this analysis was deemed pertinent. We found a significant difference in post-visualization volunteer intention by gender,  $W = 5678$ ,  $p < 0.001$ ,  $r = 0.21$ , with women (Med = 4, IQR = 1, Mean = 4.13, SD = 0.79) rating themselves as more likely to volunteer compared to men (Med = 4, IQR = 1, Mean = 3.70, SD = 0.99). There was also a significant difference in volunteer commitment by gender in the same direction,  $W = 6220.5$ ,  $p = 0.01$ ,  $r = 0.15$ . Women volunteered to rate more essay excerpts (Med = 1, IQR = 1.50, Mean = 1.01, SD = 1.29) compared to men (Med = 0, IQR = 1, Mean = 0.68, SD = 1.15).

### Natural Perspective

Approximately 41% of participants indicated that they generally use a first-person perspective when naturally visualizing the future, while only about 15% indicated that they generally use a third-person perspective. Around 43% indicated that they use both a first and third-person perspective equally. A Kruskal-Wallis test to check for an association between natural perspective (generally first, generally third, or equal) and post-visualization volunteer intention found no significant association,  $\chi^2 = 5.59$ ,  $df = 2$ ,  $p = 0.06$ ,  $\varepsilon^2 = 0.01$ . A similar test for an association between natural

perspective and number of essay excerpts participants agreed to review was also not significant,  $\chi^2=0.20$ ,  $df=2$ ,  $p=0.91$ ,  $\varepsilon^2<0.001$ ; Fig. 2d.

Chi-square tests determined that there were no significant associations between natural perspective and gender ( $\chi^2=0.53$ ,  $df=2$ ,  $p=0.77$ ), income ( $\chi^2=11.97$ ,  $df=10$ ,  $p=0.29$ ), ethnicity ( $\chi^2=13.06$ ,  $df=12$ ,  $p=0.37$ ), first-generation status ( $\chi^2=2.33$ ,  $df=2$ ,  $p=0.31$ ), or class year ( $\chi^2=5.21$ ,  $df=8$ ,  $p=0.73$ ). Additionally, a Kruskal-Wallis test determined that there was no significant association between age and natural perspective,  $\chi^2=9.14$ ,  $p=0.24$ .

## Self-Constraint

We ran a t-test to determine if self-construal was significantly different between the conditions, and found that this was not the case,  $t(266.5)=0.26$ ,  $p=0.79$ ,  $d=0.03$ . Ratings of the self as an altruistic/generous/good person were not normally distributed, so we ran a Mann-Whitney test to compare ratings between conditions. This was also not significant,  $W=9094$ ,  $p=0.91$ ,  $r=0.01$ . We hypothesized that individuals who volunteered to provide feedback on a greater number of essay excerpts would be more likely to show high agreement with the statements, “I consider myself to be an altruistic/generous/good person”. We calculated a Spearman correlation to test the relationship between volunteer commitment and ratings of the self as an altruistic/generous/good person. There was no significant correlation,  $r=0.09$ ,  $p=0.12$ . A Spearman correlation test between self-construal and one’s rating of the self as an altruistic/generous/good person was also not significant,  $r = -0.007$ ,  $p=0.91$ .

## Discussion

The concept of self-visualization has been contemplated for over a century. Yet, empirical exploration into its effects on cognition, emotion, and prosocial behavior is relatively new, having gained momentum in the last few decades. Expanding on this, our research, through two distinct experiments utilizing different visualization paradigms, examined whether first- versus third-person visualizations of oneself affect prosocial behavior. We found no evidence that manipulating the perspective taken during self-visualizations – whether envisioning future engagement in a volunteer activity or recalling past events more generally – affects one’s intention to volunteer in the present or the future, or the amount of time they spend raising money for a charity. Further, we also found no relationship between participants’ self-reported natural mode of self-perspective taking and any of our prosocial measures. Consequently, the current research does not support claims that different modes of visualizing oneself affect prosocial behaviors.

There exists a substantial body of work examining how visualizations of oneself engaging in an activity, irrespective of the perspective used, can affect performance, confidence, and behavioral intention. For instance, the general efficacy of visualization on behavior has shown positive effects in various domains, such as blood donation (Armitage & Reidy, 2008), studying for exams (Pham & Taylor, 1999), and health behavior (Knäuper et al., 2011). In line with this literature, results from

Study 2 revealed that participants in both the first- and third-person condition showed an increase in intention to volunteer after visualizing themselves engaging in the activity. While it is possible that this result could have been influenced by demand characteristics, it is noteworthy that post-visualization volunteer intention positively predicted the number of essay excerpts participants agreed to read during the current session. Given that reading essay excerpts is a costly activity, the finding helps mitigate the potential influence of demand characteristics in driving the relationship between visualizing and volunteer intention.

The findings from Study 2 suggest that it is possible that any form of self-visualization, as opposed to no visualization could enhance prosocial behaviors. However, our experiment which lacks a “no visualization” control group, was not designed to address this hypothesis. The current experiments were designed to discern the relative effectiveness of first versus third-person visualization on prosocial behavior, focusing on the direct comparison between these two perspectives rather than how they compare against a no-visualization baseline. This decision, in part, stems from the premise that self-visualization inherently involves adopting a perspective, whether first-person, third-person, or a combination of the two. Incorporating a control group in this context would necessitate asking participants to refrain from visualizing anything when contemplating the tasks and would not reflect the natural process of mental visualization, as individuals undoubtedly engage in some form of self-visualization when thinking about their future actions or past activities. Alternatively, we could have eliminated the visualization component altogether in a control group. However, this would introduce a fundamentally different experience. And, this disparate experience could potentially lead to confounding variables. Again, our primary interest lies in comparing the two perspectives, not in the presence versus absence of visualization per se – a topic already explored. Finally, our approach is consistent with the precedent set in previous literature that explores the differential effects of first versus third-person visualizations, further justifying our experimental design choice. Given the robustness of our findings, underscored by a large sample and narrow confidence intervals between the two conditions, the inclusion of a control group is unlikely to have altered our conclusion: the perspective used when visualizing self does not significantly influence prosocial behaviors.

The current results differ from previous findings that report that the perspective taken when visualizing oneself influences prosocial behaviors. A potential explanation for this discrepancy may lie in the nature of the outcome behaviors examined. The target behaviors in the present studies differ from those used previously. Behaviors such as voting, recycling, and getting vaccinated against COVID-19 may provide some real or perceived benefit to the self, whereas the target behaviors in the current studies almost exclusively serve to benefit the recipient. It may be that the perspective from which an individual views themselves matters when the behavior serves to also benefit to the self, and not just others. This interpretation is consistent with the fact that manipulating the perspective taken in visualizations of the past and future did not change the extent to which an individual sees themselves as interdependent with others, as indicated by a lack of an effect on self-construal.

On the other hand, the relevance of self-benefit in eliciting differences between perspectives remains an open question, given the mixed results in prior research. That

is, it is unclear which mode of perspective-taking is likely to have the greatest effect. For instance, adopting a first-person perspective was found to increase intentions to vaccinate against COVID-19 (Brown & de Place, 2022), while a third-person perspective was associated with greater intentions to vote (Libby et al., 2007) and recycle (Zhang et al., 2021), though in the recycling study the results were only found when participants were asked to focus on the positive outcomes of the behavior. Given our null findings coupled with the variability and context-dependency observed in prior studies, it is possible that some of the reported effects may be attributed to methodological factors, rather than reflecting a consistent influence of perspective-taking on prosocial behaviors.

In both conditions of our studies, engagement in altruistic behavior was generally quite low. Thus it is possible that the lack of an observed effect in our studies might be due to greater resistance in performing altruistic behaviors that entail personal costs, without offering direct benefits to oneself. However, it is important to note that despite this overall low engagement, there was still noticeable variability in these measures, and our studies benefited from substantial sample sizes. Still, one future direction might compare the effect of perspective in visualizations of altruistic behaviors with and without a benefit to the self, for example a verifiable volunteer opportunity that also serves as resume booster versus a volunteer activity that is difficult to receive credit for, such as cleaning trash from a local park.

Previous research relied on measures of prosocial intention, possibly leading to an overestimation of the effects, should an effect exist. Intentions are often swayed by social desirability among other factors and may not accurately represent true behavior change. In contrast, actual behavior offers a more objective and reliable measure. It captures real-world actions, unaffected by the discrepancies that can arise between what people intend to do and what they actually do. Notably, we also did not find an effect of perspective-type on our intention measure in Study 2.

Among the studies we reviewed, two also included a measure of real behavior in addition to intention, specifically, in the contexts of voting (Libby et al., 2007) and exercise (Rennie et al., 2016). However, these studies relied on self-reported data, collected post-hoc. Self-report may also not be a reliable measure of behavior because it is also prone to factors related to social desirability, norms and expectations, as well as memory recall biases. Further, only 65% of the original sample in the voting study and 44% of the original sample in the exercise study responded to the follow-up behavior measure, raising concerns about bias.

The prosocial behaviors examined in the current experiments also occur in private. If taking a third-person perspective on the self has the potential to increase altruistic behavior by increasing awareness of how others may view you, then such behaviors might need to occur in the presence of others to be influenced by this perspective-shift. This distinction between public and private contexts may moderate the effectiveness of perspective-taking interventions on prosocial behavior, for example donating money via an anonymous website versus contributing to an in-person fundraiser. This would be an interesting avenue to explore for future research.

Our studies employed more detailed manipulations compared to what has historically been used in similar studies. Other studies often described the scenario to be visualized using only a single sentence (e.g., picture yourself voting in the upcom-

ing election), whereas our participants were given several detailed prompts to imagine the given scenario. It is possible that more open-ended instructions would have allowed participants to focus more on internalizing the given perspective and less on the details of the action or the scenario being visualized. Moreover, an open-ended visualization prompt may also allow for a more naturalistic visualization experience, but possibly at the expense of increased variation in what content is visualized and thus more noise. Also, it is unclear how a more open-ended visualization task would have generated a difference between the conditions and in what direction. Nevertheless, future work might compare simple versus detailed visualization instructions for target behaviors that have an established effect.

In Study 1 we found a small but significant positive correlation between the number of videos participants watched for a charity and their self-ratings as altruistic, generous, and good individuals. The correlation may reflect participants' self-awareness of their usual generosity. However, it is probable that their charitable activity in the task influenced their self-perception, given that the self-assessment occurred post-task. In Study 1, we also found that self-rating as an altruistic person was linked to a more independent self-construal. In the context of this study, this may suggest that those with a more independent self-construal might have factored their willingness to help others into their self-ratings more than those with an interdependent self-construal. For interdependent individuals, helping others might be seen as more of a duty and responsibility rather than as a generous deed. That said, the relationship between self-construal and self-perceived altruism was small and only observed in Study 1, possibly because of its larger sample size. Additionally, the measure of self-perceived altruism did not specify to whom the participant is altruistic towards. It is possible that this rating may differ depending on the target, and asking participants to rate how altruistic they are towards strangers specifically may have yielded a more relevant response. When measuring self-perceived altruism, future research should specify whether the question refers to altruism towards family, friends, strangers, etc.

Despite the enduring fascination in self-visualization, our research indicates that neither the manipulation of self-visualization (first-person or third-person) nor individuals' natural visualization tendencies impact prosocial intentions or behaviors. These findings, coupled with the mixed results from prior studies, suggest that the role of perspective in self-visualization on prosocial behavior is either more complex than appreciated or potentially inconsequential. Our results highlight the need for further investigation into the cognitive processes underlying prosocial behavior, pointing to factors beyond the simple dichotomy of one's mental self-visualization.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s40750-024-00238-1>.

**Author Contributions** The study was conceptualized by S.E.W. and C.L.A. Study materials were created by S.E.W. and H.Q.S. Data was processed and analyzed by S.E.W. with input from C.L.A. The manuscript was written by S.E.W. and C.L.A.

**Funding** Funding for this research was provided by the Department of Psychology at the University of Pennsylvania.

**Data Availability** Data for Study 1 is provided on the Open Science Framework at: [https://osf.io/q3kad/?view\\_only=777fd9fbd37a42c5a2b0b7d3656e3b52](https://osf.io/q3kad/?view_only=777fd9fbd37a42c5a2b0b7d3656e3b52)Data for Study 2 is provided on the Open Science Framework at: [https://osf.io/jbfua/?view\\_only=b8cf56ffdf7043eea8e27d8f17ff3ab](https://osf.io/jbfua/?view_only=b8cf56ffdf7043eea8e27d8f17ff3ab).

## Declarations

**Ethical Approval** The project was approved by the University of Pennsylvania institutional review board and complies with the current laws of the United States. All participants gave informed consent prior to their inclusion in the study.

**Competing Interests** The third author, Coren L. Apicella, is an associate editor at Adaptive Human Behavior and Physiology.

**Conflict of interest** The authors declare they have no conflict of interest.

**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

## References

- Agerström, J., Björklund, F., & Carlsson, R. (2013). Look at yourself! Visual perspective influences moral judgment by level of mental construal. *Social Psychology, 44*, 42–46. <https://doi.org/10.1027/1864-9335/a000100>.
- Akhtar, S., Justice, L. V., Loveday, C., & Conway, M. A. (2017). Switching memory perspective. *Consciousness and Cognition, 56*, 50–57.
- Armitage, C. J., & Reidy, J. G. (2008). Use of mental simulations to change theory of planned behaviour variables. *British Journal of Health Psychology, 13*(3), 513–524.
- Ayduk, Ö., & Kross, E. (2010). From a distance: Implications of spontaneous self-distancing for adaptive self-reflection. *Journal of Personality and Social Psychology, 98*(5), 809–829. <https://doi.org/10.1037/a0019205>.
- Bateson, M., Nettle, D., & Roberts, G. (2006). Cues of being watched enhance cooperation in a real-world setting. *Biology Letters, 2*(3), 412–414.
- Berezkei, T., Birkas, B., & Kerekes, Z. (2007). Public charity offer as a proximate factor of evolved reputation-building strategy: An experimental analysis of a real-life situation. *Evolution and Human Behavior, 28*(4), 277–284.
- Brown, G., & de Place, A. L. (2022). I dream of socializing, sports, and serenity: Imagining a positive future-vaccinated self is associated with better attitudes toward COVID-19 vaccination. *Journal of Applied Social Psychology, 52*(10), 1017–1029.
- Christian, B. M., Miles, L. K., Parkinson, C., & Macrae, C. N. (2013). Visual perspective and the characteristics of mind wandering. *Frontiers in Psychology, 4*, 699.
- Cohen, D., & Gunz, A. (2002). As seen by the other... perspectives on the self in the memories and emotional perceptions of easterners and westerners. *Psychological Science, 13*(1), 55–59.
- Crisp, R. J., & Husnu, S. (2011). Attributional processes underlying imagined contact effects. *Group Processes & Intergroup Relations, 14*(2), 275–287.
- D'Argembeau, A., Comblain, C., & Van der Linden, M. (2003). Phenomenal characteristics of autobiographical memories for positive, negative, and neutral events. *Applied Cognitive Psychology: The Official Journal of the Society for Applied Research in Memory and Cognition, 17*(3), 281–294.

- D'Argembeau, A., & Van der Linden, M. (2004). Phenomenal characteristics associated with projecting oneself back into the past and forward into the future: Influence of valence and temporal distance. *Consciousness and Cognition*, *13*(4), 844–858.
- D'Argembeau, A., & Van der Linden, M. (2012). Predicting the phenomenology of episodic future thoughts. *Consciousness and Cognition*, *21*(3), 1198–1206. <https://doi.org/10.1016/j.concog.2012.05.004>.
- Eich, E., Nelson, A. L., Leghari, M. A., & Handy, T. C. (2009). Neural systems mediating field and observer memories. *Neuropsychologia*, *47*(11), 2239–2251.
- Ernest-Jones, M., Nettle, D., & Bateson, M. (2011). Effects of eye images on everyday cooperative behavior: A field experiment. *Evolution and Human Behavior*, *32*(3), 172–178.
- Eyal, T., Liberman, N., & Trope, Y. (2008). Judging near and distant virtue and vice. *Journal of Experimental Social Psychology*, *44*(4), 1204–1209. <https://doi.org/10.1016/j.jesp.2008.03.012>.
- Frank, M. G., & Gilovich, T. (1989). Effect of memory perspective on retrospective causal attributions. *Journal of Personality and Social Psychology*, *57*(3), 399–403. <https://doi.org/10.1037/0022-3514.57.3.399>.
- Freud, S. (1899). The interpretation of dreams, trans. J. Crick. Oxford University Press. (Original work published in 1899.)[SL].
- Haley, K. J., & Fessler, D. M. (2005). Nobody's watching? Subtle cues affect generosity in an anonymous economic game. *Evolution and Human Behavior*, *26*(3), 245–256.
- Hashimoto, H., & Yamagishi, T. (2013). Two faces of interdependence: Harmony seeking and rejection avoidance. *Asian Journal of Social Psychology*, *16*(2), 142–151.
- Henri, V., & Henri, C. (1896). Investigation of early childhood memories. *The Psychological Year*, *3*(1), 184–198.
- Huebner, D. M., & Fredrickson (1999). B.L. gender differences in memory perspectives: Evidence for self-objectification in women. *Sex Roles*, *41*, 459–467. <https://doi.org/10.1023/A:1018831001880>.
- Klimecki, O. M., Mayer, S. V., Jusyte, A., Scheeff, J., & Schönberg, M. (2016). Empathy promotes altruistic behavior in economic interactions. *Scientific Reports*, *6*(1), 31961.
- Knäuper, B., McCollam, A., Rosen-Brown, A., Lacaille, J., Kelso, E., & Roseman, M. (2011). Fruitful plans: Adding targeted mental imagery to implementation intentions increases fruit consumption. *Psychology and Health*, *26*(5), 601–617.
- Libby, L. K., Shaffer, E. M., Eibach, R. P., & Slemmer, J. A. (2007). Picture yourself at the polls: Visual perspective in Mental Imagery affects Self-Perception and Behavior. *Psychological Science*, *18*(3), 199–203. <https://doi.org/10.1111/j.1467-9280.2007.01872.x>.
- Lorenz, C., & Neisser, U. (1985). Factors of imagery and event recall. *Memory & Cognition*, *13*, 494–500.
- Macrae, C. N., Mitchell, J. P., McNamara, D. L., Golubickis, M., Andreou, K., Möller, S., Peytcheva, K., Falben, J. K., & Christian, B. M. (2016). Noticing future me: Reducing Egocentrism through Mental Imagery. *Personality and Social Psychology Bulletin*, *42*(7), 855–863. <https://doi.org/10.1177/0146167216644961>.
- Manesi, Z., Van Lange, P. A., & Pollet, T. V. (2016). Eyes wide open: Only eyes that pay attention promote prosocial behavior. *Evolutionary Psychology*, *14*(2), 1474704916640780.
- McDermott, K. B., Wooldridge, C. L., Rice, H. J., Berg, J. J., & Szpunar, K. K. (2016). Visual perspective in remembering and episodic future thought. *Quarterly Journal of Experimental Psychology*, *69*(2), 243–253.
- Nettle, D., Nott, K., & Bateson, M. (2012). 'Cycle thieves, we are watching you': Impact of a simple signage intervention against bicycle theft. *PloS One*, *7*(12), e51738.
- Niese, Z. A., Eibach, R. P., & Libby, L. K. (2022). Picturing yourself: A social-cognitive process model to integrate third-person imagery effects. *Journal of Cognitive Psychology*, *34*(1), 24–44.
- Nigro, G., & Neisser, U. (1983). Point of view in personal memories. *Cognitive Psychology*, *15*(4), 467–482. [https://doi.org/10.1016/0010-0285\(83\)90016-6](https://doi.org/10.1016/0010-0285(83)90016-6).
- Pham, L. B., & Taylor, S. E. (1999). From thought to action: Effects of process-versus outcome-based mental simulations on performance. *Personality and Social Psychology Bulletin*, *25*(2), 250–260.
- Powell, K. L., Roberts, G., & Nettle, D. (2012). Eye images increase charitable donations: Evidence from an opportunistic field experiment in a supermarket. *Ethology*, *118*(11), 1096–1101.
- Pronin, E., & Ross, L. (2006). Temporal differences in trait self-ascription: When the self is seen as an other. *Journal of Personality and Social Psychology*, *90*(2), 197–209. <https://doi.org/10.1037/0022-3514.90.2.197>.
- Rennie, L., Uskul, A. K., Adams, C., & Appleton, K. (2014). Visualisation for increasing health intentions: Enhanced effects following a health message and when using a first-person perspective. *Psychology & Health*, *29*(2), 237–252.

- Rennie, L. J., Harris, P. R., & Webb, T. L. (2016). Visualizing actions from a third-person perspective: Effects on health behavior and the moderating role of behavior difficulty: Visualization and perspective. *Journal of Applied Social Psychology, 46*(12), 724–731. <https://doi.org/10.1111/jasp.12410>.
- Rice, H. J., & Rubin, D. C. (2009). I can see it both ways: First- and third-person visual perspectives at retrieval. *Consciousness and Cognition, 18*(4), 877–890. <https://doi.org/10.1016/j.concog.2009.07.004>.
- Robinson, J. A., & Swanson, K. L. (1993). Field and observer modes of remembering. *Memory (Hove, England), 1*(3), 169–184.
- Saine, R., Kull, A. J., Besharat, A., & Varki, S. (2021). I see me: The role of observer imagery in reducing consumer transgressions. *Journal of Business Ethics, 168*, 721–732. <https://doi.org/10.1007/s10551-019-04193-w>.
- Skarmeas, D., & Shabbir, H. A. (2011). Relationship quality and giving behaviour in the UK fundraising sector: Exploring the antecedent roles of religiosity and self-construal. *European Journal of Marketing, 45*(5), 720–738. <https://doi.org/10.1108/03090561111120000>.
- Storms, M. D. (1973). Videotape and the attribution process: Reversing actors' and observers' points of view. *Journal of Personality and Social Psychology, 27*(2), 165–175. <https://doi.org/10.1037/h0034782>.
- Sutin, A. R., & Robins, R. W. (2010). Correlates and phenomenology of 1st and 3rd person Memories. *Memory (Hove England), 18*(6), 625–637. <https://doi.org/10.1080/09658211.2010.497765>.
- Tausen, B. M., Miles, L. K., Lawrie, L., & Macrae, C. N. (2018). It wasn't me: The role of perspective in self-perceptions of responsibility. *Consciousness and Cognition, 63*, 89–98. <https://doi.org/10.1016/j.concog.2018.06.013>.
- Wu, J., Balliet, D., & Van Lange, P. A. (2016). Reputation, gossip, and human cooperation. *Social and Personality Psychology Compass, 10*(6), 350–364.
- Yin, Y., & Wang, Y. (2023). Is empathy associated with more prosocial behaviour? A meta-analysis. *Asian Journal of Social Psychology, 26*(1), 3–22.
- Yong Seo, J., & Scammon, L., D (2014). Does feeling holier than others predict good deeds? Self-construal, self-enhancement and helping behavior. *Journal of Consumer Marketing, 31*(6/7), 441–451. <https://doi.org/10.1108/JCM-06-2014-1029>.
- Zhang, J., Zhao, L., & Hu, S. (2021). Visualizing recycling: Promoting recycling through mental simulation. *Resources Conservation and Recycling, 174*, 105783. <https://doi.org/10.1016/j.resconrec.2021.105783>.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.