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## ARE FUTURE SELVES TREATED LIKE OTHERS ? COMPARING DETERMINANTS AND LEVELS OF INTRAPERSONAL AND INTERPERSONAL ALLOCATIONS

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### Abstract

People often make tradeoffs between current and future benefits. Some research frameworks suggest that people *treat the future self as if it were another person*, subordinating future needs to current ones just as they might subordinate others’ needs to their own. Although people make similar choices for future selves and others in some contexts, it remains unclear whether these behaviors are governed by the same decision policies. So, we identify and compare the unique influence of four relevant factors (need, deservingness, liking, and similarity) on monetary decisions in both the interpersonal and intrapersonal domains. Do people treat the future self and others similarly? Yes and no. Yes, because the influence of these factors on allocations is similar for both types of targets. No, because monetary allocations to the future self were consistently higher than allocations to others. Although the future self is treated like others in some ways, important differences remain that are not fully captured by this analogy.

KEYWORDS: identity, decision making, interpersonal allocation, intertemporal choice, future self

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## 1. Introduction

### 1.1. *The “future-self-as-other” analogy*

It has been argued that people prioritize their current needs over their future ones similarly to the way they prioritize their own current needs over those of third parties (e.g., Bartels & Rips, 2010; Bartels & Urminsky, 2011; 2015; Bryan & Hershfield, 2012; Ersner-Hershfield, Garton, Ballard, Samanez-Larkin, & Knutson, 2009; Hershfield & Bartels, 2018). For example, in studies where people allocate money to their current selves and to other targets, monetary allocations to future selves decrease across temporal distance (the standard temporal discounting pattern) and decrease across social distance for others, following a roughly similar hyperboloid pattern (Jones & Rachlin, 2006; Rachlin & Jones, 2008). Also, both types of giving respond similarly to certain manipulations, such as the introduction of an initial delay (Yi, Charlton, Porter, Carter, & Bickel, 2011; Osiński, Karbowski, & Ostaszewski, 2015).

There is also a burgeoning literature highlighting how people think about the relations between selves distributed across time (e.g., the relationship between oneself now and in 20 years) or before and after some potentially transformative event (e.g., having a child or experiencing a religious conversion; see the recent volume edited by Lambert & Schwenkler, in press; Molouki, Chen, Urminsky, & Bartels, in press; Newman, Bloom, & Knobe, 2014; Paul, 2014; Starmans & Bloom, 2018; Strohminger, Knobe, & Newman, 2017; Strohminger & Nichols, 2014; Tobia, 2015). This literature also examines how people’s perceptions of continuity over time might be relevant for intertemporal decisions, allocation choices, and discounting of future outcomes. (The link from continuity over time to forward-looking choice that these papers examine often borrows inspiration from a philosophical account proposed by Derek Parfit [1984].) These papers find that, compared to people who anticipate small amounts of personal change, those who experience or perceive large amounts of personal change prefer to consume sooner, spend rather than save, and generally discount future outcomes more when intertemporal tradeoffs are highlighted (Bartels & Rips, 2010; Bartels & Urminsky 2011; 2015; Ersner-Hershfield et al., 2009; Hershfield, 2011).

Several frameworks of intertemporal thought, self-control, and temporal discounting build on theory from the personal continuity literature by invoking a “future-self-as-other” analogy. These frameworks suggest that people think about the future self as if it were in fact

another person, and act accordingly when it comes to making decisions and behaviors that impact this future self. However, one key takeaway from much of the personal continuity research is that the future self needn't necessarily be perceived as being an entirely different person, and likely wouldn't be in most ordinary circumstances. Instead, the future self can be perceived as being less like the present self to varying degrees (e.g., Bartels & Rips, 2010; Starmans & Bloom, 2018). As people perceive less continuity between the present self and a version of the future self, they might feel less concern toward that future self. This reduction in concern, in turn, would affect allocations and decisions accordingly. Therefore, some have suggested that researchers should be cautious of overstating the “future-self-as-other” analogy because the future self may be perceived as a somewhat changed version of the present self, rather than as a completely different person (e.g., Bartels & Rips 2010; Urminsky and Bartels, in press).

The existing literature does not offer a direct test of how well the “future-self-as-other” analogy actually relates to choices – in other words, do people make decisions for future selves in the same way that they make decisions for completely separate people? So, we set out to design studies that offer a straightforward test of the “future-self-as-other” notion in the context of intertemporal allocation decisions.

### *1.2 Research motivation*

Because allocations to future selves and to others have not, to date, been carefully compared, it is unclear how well the “future-self-as-other” analogy maps to people's future-oriented behavior. Thus, our goal is to examine whether interpersonal and intrapersonal allocations are similar, both in how much is allocated to each type of target, and whether these decisions are sensitive to similar or different factors.

Despite the fact that both interpersonal and intrapersonal allocations are characterized by the decision to shift resources away from one's current self, there are important differences between the two. For example, an intrapersonal allocation (but not necessarily an interpersonal allocation) involves the inherent assumption that resources will shift back to the self at some point in the future. Because of such differences, it is not clear whether people's decision policies would be the same for decisions about these two different types of allocations. Even if people allocate similar amounts of money to the future self as to another person, they may focus on

different attributes of the targets when coming to this decision. For example, for interpersonal allocations, people might focus on how much they like a particular recipient, whereas for intrapersonal allocations, people might focus on situational factors such as an assessment of current versus future need.

Existing research comparing intrapersonal and interpersonal allocation (e.g., Pronin, Olivola, & Kennedy, 2008; Rachlin & Jones, 2008) has only compared decision *outcomes*, and the question of whether these outcomes stem from similar *decision policies* used for the self and other has not been tested directly. The studies we present in this paper examine the aptness of the “future-self-as-other” analogy for intertemporal choices. We do so by directly comparing allocations to others and allocations to possible future selves, both in terms of outcomes *and* in terms of the decision policies that lead to those outcomes.

Furthermore, past studies that have compared judgments or behaviors involving the future self to those involving others (e.g., Ersner-Hershfield, Wimmer, & Knutson, 2009; Pronin, Olivola & Kennedy, 2008; Pronin & Ross, 2006), have not specifically used instances of “future self” and “other” that are otherwise matched on various dimensions. In the current studies, we carefully equate future self with another person on characteristics known to affect allocations. Our studies are the first to examine the amount that people allocate to pairs of directly comparable targets that span the space of others and future selves. This design feature allows us to ask whether people will allocate the same amount to the future self and another person all else being held equal, or whether fundamental differences exist between these two types of targets.

If we find that decisions about these two kinds of allocations are characterized by similar decision policies, then such a result could lend credence to some of the assumptions and implications of frameworks that make use of the “future-self-as-other” analogy. For example, certain interventions used to influence interpersonal giving, such as highlighting similarity to the self (Batson, Turk, Shaw, & Klein, 1995), could also be leveraged to affect giving to future selves. However, if determinants of allocations to the future self are in no way comparable to allocations to others, this could undermine the idea that people make intertemporal and interpersonal choices in a similar way. Such a finding would call the “future-self-as-other” analogy into question, suggesting that we should exercise caution about potentially overstating the idea that people treat the future self as if it were entirely another person. It’s also possible

that the ways in which the allocations are similar or dissimilar could distinguish the ways in which this analogy may be more or less instructive.

The current studies are exploratory in nature, centering on (i) whether levels of allocation to others and the future self are similar in amount and (ii) whether various factors affect these allocations in the same way. Our studies are not aimed at providing a definitive test of the descriptive adequacy of any one model relative to another. Nevertheless, by exploring similarities and dissimilarities in allocation to selves and others, we hope that our results can inform refinements to the frameworks used to describe the role of the future self in intertemporal choice.

### *1.3. Determinants of interpersonal and intrapersonal allocations*

In addition to being a first direct comparison of the determinants of interpersonal and intrapersonal allocations, the current research is the first to simultaneously examine several factors previously separately identified as influential for interpersonal allocations (need, deservingness, liking, and similarity). By examining these factors within the same set of experiments, we are able to identify and separate the unique influence of each factor. Previous research that has examined these factors in the context of interpersonal allocations has generally focused on the influence of a single determining factor, often without explicitly recognizing the possibility of other confounding factors. For example, one line of research has examined the influence of a potential recipient's need in interpersonal resource allocations (Bohnet & Frey, 1999; Cappelen, Moene, Sørensen, & Tongodden, 2013; Charness & Rabin, 2002; Engel, 2011; Fong, 2007; Goeree, McConnell, Mitchell, Tromp, & Yariv, 2010; Jones & Rachlin, 2006; Yaari & Bar-Hillel, 1984). Other factors separately studied in the context of interpersonal allocations include social distance (Bohnet & Frey, 1999; Goeree et al., 2010; Jones & Rachlin, 2006; Leider, Möbius, Rosenblat, & Do, 2009; Rachlin & Jones, 2008) and perceived deservingness. The latter of these may be determined by whether the potential recipient has earned the payment (e.g., Oxoby & Spraggon, 2008), or, alternatively, whether the recipient is thought to be morally worthy of the payment (Fong, 2007; Fong & Luttmer, 2011; Fong & Oberholzer-Gee, 2011).

In the realm of *intrapersonal* allocations, research has mainly focused on the role of perceived similarity between the current and future self while largely neglecting other potentially important factors (need, deservingness, liking) (Adelman et al., 2017; Bartels & Rips, 2010;

Bartels & Urminsky, 2011; Ersner-Hershfield et al., 2009). There has been no systematic logic for why certain factors have been more frequently studied for interpersonal allocations (e.g., need), and others more frequently studied in intrapersonal contexts (e.g., similarity). As a whole, existing research suggests several factors that may be important for these decisions, but the question of whether the determinants of each type of allocation are similar or not remains unstudied. This paper presents the first studies we know of that systematically (i) account for, (ii) separately manipulate, and (iii) isolate the influence of several factors to assess whether intrapersonal and interpersonal allocations are responsive to the same influences. Examining multiple factors in conjunction presents us with a more complete picture of the relative influence of these factors in both intrapersonal and interpersonal allocations than has been previously provided.

#### *1.4. Studies*

All study procedures reported in this paper were approved by the University of Chicago Institutional Review Board for research involving human subjects. In a first set of pilot studies, we examine whether factors highlighted in previous research are in fact those that people report considering when making allocations. We also confirm that these factors can be manipulated independently of each other and of the type of target (i.e., future self or other). These pilot studies establish the necessary conditions for analyzing whether similar decision policies govern interpersonal and intrapersonal monetary allocations. The two main studies investigate the focal question of whether similar policies characterize allocations to the future self and to others, both by using self-report (Study 1) and by measuring effects on decision outcomes (Study 2). Overall, we find that people consistently give more money to the future self (at the expense of the current self) than they give to others. However, their allocations to both types of recipients are similarly sensitive to variation in liking, similarity, need, and deservingness—in other words, their decision policies are remarkably consistent between interpersonal and intrapersonal targets.

Sample sizes for all studies (except for exploratory pilot studies) were determined a priori to achieve 80% power based on effect sizes estimated via pretesting of each study's methods. Also, the factors that we tested for their influence on allocations (liking, similarity, need, deservingness) were elicited and pretested across several independent samples of participants in our pilot studies. These procedures provide us with some confidence that, at least in the context

of the self-report methods used, our stimuli adequately represent the relevant characteristics governing allocation decisions.

## **2. Study 1: Self-reported importance of information for allocation decisions**

### *2.1. Pilot studies 1-3*

Our main studies rely on the generation of stimuli that will accurately measure the constructs believed to influence allocation decisions. To inform our generation of such stimuli, we first conducted an exploratory lab study (Pilot Study 1;  $N=31$ ). In this study, we elicited open-ended responses about what information people would want to have before making decisions about monetary allocations to another person (i.e., interpersonal allocations) or the future self (i.e., intrapersonal allocations). The majority of participants provided responses that were coded as falling into one of the four categories of need, deservingness, liking, or similarity. No other major constructs of interest were consistently identified. These findings trained our investigation on these four categories as our factors of interest (see Appendix A, Table A.1).

Pilot Study 2 was used to generate the specific stimuli used in Study 1. First, a sample of participants from Amazon Mechanical Turk (AMT;  $N=101$ ) generated specific questions that they would ask another person when trying to assess liking, similarity, need, and deservingness. A separate sample of participants ( $N=71$ ) then selected questions (created by the first sample) that they believed were most representative of the four constructs of interest. The two top-ranking questions for each category were used as stimuli in Study 1 (see Table 1 for the listing of questions used).

Finally, Pilot Study 3 (AMT;  $N=100$ ) was used to determine the adequate amount of time that would need to pass before the future self would be considered changed from the current self. This was done to ensure that the time delay provided to participants would be long enough for people to imagine a plausible future self with specified characteristics that may or may not apply to the current self. Based on the results of Pilot Study 3, a time period of five years in the future was chosen for evaluations of the future self in our main studies. This was shortest period of time for which the majority of participants in Pilot Study 3 reported that it was plausible that their future self could have significantly changed from the current self (and thus could ostensibly be thought of as one thinks about another person; see Appendix A, Table A.2).

### *2.2 Study 1 method*

Three hundred and twenty-eight participants from AMT completed a ranking task twice in counterbalanced order. In one version of the task, they were asked to make judgments about an allocation to another person that was unknown to them. In the other version, they made judgments about an allocation to the future self in five years, the time period used for the future self based on the results of Pilot Study 3. In the ranking task, participants placed eight questions in order based on how useful they would find each to be in deciding whether and how much money to give to the specified target (with 1 being most useful, and 8 being least useful). Questions were presented in randomized order, and participants only viewed the specific questions without being made aware of the four categories that they were designed to represent. In making their rankings about the informational value of each question, participants were instructed to assume that they would receive an honest answer to any question that was asked.

<b>Questions from Need Category</b>	<b>Questions from Deservingness Category</b>
Are you behind on bills that provide basic living needs (house, car, heat, etc.)?	Why do you need money?
Can you afford to pay for food for your family?	If you were given some money, what would you use it for?
<b>Questions from Liking Category</b>	<b>Questions from Similarity Category</b>
Do you treat people nicely?	What are your interests?
What does friendship mean to you?	What are your hobbies?

Table 1. Listing of questions used in Study 1.

### 2.3. Results

#### 2.3.1. Order effects

Initial analyses looking at the order of target type (other/future self) presented revealed a significant order\*question interaction on ranking of informational value for self-allocations  $F(7, 2282)=2.71, p=.008$  ( $p=.023$  after Greenhouse-Geisser correction for violation of sphericity),  $\eta_p^2 = .008$  and a marginal order\*question interaction on ranking of informational value for other-allocations  $F(7, 2282)=2.02, p=.050$  ( $p=.094$  after Greenhouse-Geisser correction for violation of sphericity),  $\eta_p^2 = .006$ . An ordinal logistic regression analysis (treating the dependent variable as an ordinal ranking rather than a continuous variable) confirmed a significant interaction between order of target presentation and question ratio (for ratings of the future self: likelihood ratio  $\chi^2$  (1,

7) = 23.09,  $p = .002$  for overall interaction term; for ratings of others: likelihood ratio  $\chi^2(1, 7) = 14.19$ ,  $p = .048$  for overall interaction term). Because these order effects were observed, we performed the analyses on responses for only the first target presented to each participant. However, we found that the interpretation of the results was not significantly changed from when we analyzed the entire dataset. Therefore, we retain all data points in the results reported below (results considering only the first target presented are included in Appendix B).

### 2.3.2. Comparison of question rankings for future self and others

Across both types of targets, information about both need and deservingness (mean importance = 5.52, SD = 1.30) was consistently considered to be more important than information about both liking and similarity (mean ranking = 3.48, SD = 1.30), as confirmed by a Wilcoxon signed-rank test ( $W = 168570$ ,  $p < .001$ ; see Figure 3, where importance is displayed as the reverse score of participant's rankings).

Also, there was a significant target \* question interaction,  $F(7, 2289) = 7.56$ ,  $p < .001$ ,  $\eta_p^2 = .007$ , and target \* category interaction  $F(3, 981) = 11.20$ ,  $p < .001$ ,  $\eta_p^2 = .009$ , on the participants' rankings. These interactions suggest that people assigned different patterns of usefulness to the different types of information based on whether they were thinking about an allocation to the future self versus to another person.

When the target recipient was the future self, people reported that information about need (Wilcoxon rank sum test,  $W = 10214$ ,  $p = 0.01$ ) and similarity ( $W = 8646$ ,  $p < .001$ ) was relatively more important compared to when the target was another person (see Figure 1). In contrast, when the target recipient was another person, people reported that information about deservingness ( $W = 15927$ ,  $p = 0.002$ ) and liking ( $W = 17880$ ,  $p < .001$ ) was relatively more important than when the target was the future self. However, as can be seen from the figure, these target-driven differences were much smaller in magnitude than the common difference in importance between need/deservingness and liking/similarity across both types of targets. Furthermore, the mean within-subjects Spearman's rank-order correlation between importance ratings of each factor for others and the same factor for future selves was  $r_s = 0.518$ .<sup>1</sup> This correlation indicates a moderately high degree of agreement between the pattern of characteristics a given participant considers to be important for evaluating others and future selves.

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<sup>1</sup> Excludes data from one participant whose importance ratings had zero variance.

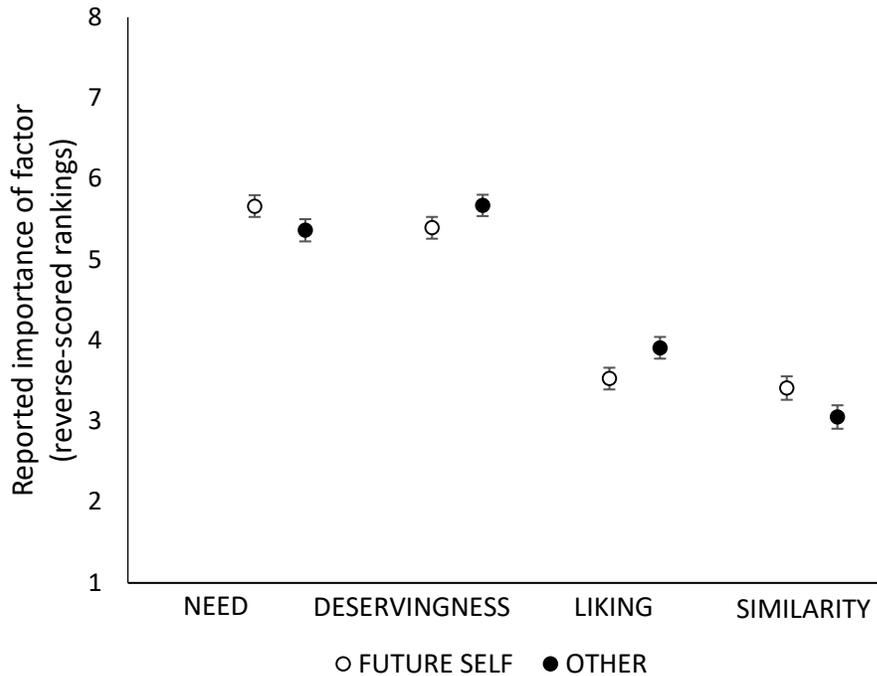


Figure 1. Participant ratings from Study 1 of how important each factor would be to them when making a decision about an allocation to future self or another person. Importance is displayed as the average ranking (on a 1-8 scale) of the two questions representing that factor. Rankings are reverse-scored such that higher numbers indicate greater perceived importance. Error bars are 95% CIs.

### 3. Study 2: Allocations to others and future selves

Study 2 compares amounts allocated to interpersonal and intrapersonal targets and examines how sensitive these allocations are to each of the four factors of liking, similarity, need, and deservingness. Participants were asked to make allocations to different targets (both others and future selves) that systematically varied on levels of the factors of interest. A multiple regression analysis was used to measure the influence of liking, similarity, need, and deservingness on interpersonal and intrapersonal allocations, and also to examine the influence of target type (self or other) on the overall allocation amount. Do people treat the future self as if it were another person? If slopes for each predictor (liking, similarity, need, deservingness) are substantially similar when predicting allocations to both target types (self and other), this

suggests that intrapersonal and interpersonal allocations are similarly sensitive to variation the factors of interest. We might then conclude that people use similar decision criteria for allocating to the future self and others. However, the existence of (i) overall differences in level of allocation (e.g., allocating more to future selves than to others), or (ii) target-based differences in reliance on the factors considered would suggest that people are not treating their future selves exactly like they treat others.

### *3.1. Pilot studies 4-5*

Before assessing our dependent variable of interest, we tested, in two more pilot studies, whether people can generate target persons (for both the future self and another person) that vary independently along all four factors measured. The goal of these tests was to confirm that the unique influence of each factor can be isolated via our study design. In Pilot Study 4, an online sample ( $N=180$ , AMT) completed a survey about perceptions either of others or of themselves (manipulated between subjects).

Each participant generated four targets in total that would fall into each cell of a 2x2 matrix crossing high and low levels of two out of the four factors of interest (liking, similarity, need, deservingness). For example, a participant assigned to the factors liking and similarity in the “other” condition was asked to describe four different acquaintances that fell into each of the following categories: (i) high in both liking and similarity, (ii) high in liking and low in similarity, (iii) low in liking and high in similarity, and (iv) low in both liking and similarity. Participants assigned to the “self” condition generated four versions of the future self that met the same criteria.<sup>2</sup> Within each characteristic-pair condition, the other two non-manipulated characteristics were not mentioned during the target generation phase (see Appendix A for the exact prompts provided).

Regardless of the two characteristics that had been manipulated, participants then provided ratings on all four dimensions (liking, similarity to the current self, need, and deservingness) for each target on a sliding scale of 0 (not at all) to 100 (very much). An analysis of mean ratings confirmed that the manipulations moved targets significantly in the intended direction for the factors of interest (see Figure A.1 and Table A.3. in Appendix A). Also, the

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<sup>2</sup> Participants in the “self” condition were asked to imagine and describe possible versions of themselves in 5 years that had the relevant characteristics. A time period of five years was chosen because it was the shortest period for which the majority of participants in Pilot Study 3, reported in Appendix A, reported that it was plausible that their future self could be significantly changed from the current self.

average within-subjects variance in target ratings was significantly larger for ratings of factors that were manipulated versus those that were not manipulated (see Table A.4 in Appendix A). Though we do not claim that the four factors of interest are unrelated (as demonstrated by significant cross-factor response and within-subjects correlations between the factors, see Tables A.3 and A.5–A.7 in Appendix A), our findings suggest that people are in fact able to generate distinct targets both high and low on each factor independently of levels of the other factors. This confirms that we can meaningfully examine the separate influence of each factor.

Pilot Study 5 ( $N=79$ , AMT) replicated the results of Pilot Study 4 with target type (self/other) manipulated within participants. This pilot ensured that the results of our between-subjects ratings were not affected by distortions in rating scales caused by large differences in the range of possible values for others versus the self. In the within-subjects version of the study, participants rated both another person and the corresponding version of the future self side by side. The variation in each rated characteristic due to the manipulations (high/low) was then compared to variation due to the type of target being rated (self/other). We verified that the means of all “high” conditions for each characteristic fell significantly above the means of all “low” conditions for each characteristic, regardless of target type. We also confirmed that the difference in ratings due to the high/low manipulation was significantly larger than the overall difference due to target type for each of the four comparisons (see Figure A.2 and Table A.8 in Appendix A).

Across the four characteristics measured, the average difference in ratings related to the manipulations fell between 3.91 times (for liking) to 8.68 times (for need) larger than the average difference due to target type. In short, the high and low manipulations were effective at significantly varying the level of each factor in the intended fashion, and ratings of the factors of interest did not seem to be overly affected by target type. So, our pilot tests confirm that it is possible to manipulate the factors of interest as desired for both types of targets, making it feasible to directly compare the relative influence of each characteristic for interpersonal and intrapersonal allocations.

### *3.2. Study 2 method*

One hundred and eighty participants from AMT participated in a study involving hypothetical allocations. Two participants were excluded after reporting technical difficulties

completing the survey, leaving a final N of 178. Each participant was randomly assigned to one condition corresponding to a combination of two of the four factors (liking/similarity, liking/need, liking/deservingness, similarity/need, similarity/deservingness, need/deservingness). Participants were asked to generate four targets consisting of others known to them, and four targets consisting of versions of the future self in five years (with the order of the self-generation and other-generation blocks counterbalanced). Within each of these blocks, participants generated one target corresponding to each cell of a 2x2 matrix crossing high and low levels of the two factors from their assigned between-subjects condition.

For example, a participant assigned to the need/deservingness condition would be asked to generate both a version of the future self and an acquaintance meeting each of the following conditions: one target characterized by high need and high deservingness, one target characterized by high need and low deservingness, one target characterized by low need and high deservingness, and one target characterized by low need and low deservingness, for a total of eight targets (using the same prompts as in Pilot Studies 4 and 5; see Appendix A). Participants specified each target by providing a name and short description of each (elicitations of the four targets within each block were presented in randomized order). Sample descriptions provided by study participants for others and future selves in each condition can be found in Appendix C.

After all eight targets were generated, participants were asked how they would allocate \$10 between themselves and each of the eight targets. Each allocation choice was independent of all the others. They were told that although the allocations were hypothetical, they should try to report them as closely as possible to what their true preference would be. Finally, participants were presented with four rating scales where they reported perceived liking, similarity to the current self, need, and deservingness of all targets. (Participants were informed that they should answer these questions according to their true feelings, and that there were no right or wrong answers, to reduce possible demand effects related to elicitation condition).

Targets (self and other) that had been elicited using the same combinations of characteristics were presented on the same screen in two columns using the name and description previously provided by the participant. Participants then completed four sliding scales below each target. For example, on one page, a participant might see the acquaintance they had named in response to the high need/high deservingness prompt, alongside the future self they had generated in response to the same prompt. The participant would reply to questions about liking,

similarity, need, and deservingness for each (order of presentation of the columns and slider questions was randomized). See Appendix C, Figure C.1 for a screenshot of this procedure.

In addition, 180 participants participated in a version of the study involving real incentives. The methods were identical to those described above, with the exception that the hypothetical allocation instructions were replaced with an incentivized version. Specifically, before making their allocations, participants read: “Please note that 25% of participants will be chosen after this study, via a random draw, to actually receive \$10 (via AMT bonus) and enact one of their allocations. Therefore, we ask that you please think carefully and answer each question in line with your actual preferences.” Previous research suggests that participants presented with a probabilistic chance of receiving a payout tend to make similar decisions to those they would make when expecting a certain receipt of cash (Starmer & Sugden, 1991).

Five days after the completion of this version of the study, 45 participants were chosen via random draw and awarded \$10 (in addition to their existing study payment). For each of these participants, one of their eight allocations (either to an acquaintance or to the future self) was also randomly chosen and communicated to them as the one that would be enacted. Actual enactment of the allocation was left up to the participant. Participants were informed that although the experimenters would not ascertain that they would actually carry out the allocation, they were encouraged to do so to remain consistent with their previously stated preferences.<sup>3</sup>

### 3.3. Results

Because results did not significantly differ between the hypothetical and incentive-compatible versions of the study (see Appendix D, Table D.1), we report the combined results (N=358) in the following sections. Results for each of the two versions are also reported separately in Appendix D.

#### 3.3.1. Distribution of allocations

Each participant made 8 allocations, resulting in a total of 2864 allocations across the entire sample (1432 to future selves and 1432 to others). The distribution of allocations was

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<sup>3</sup> Before the study, we informed participants about the probabilistic incentive, however we purposefully did not provide extensive detail about how the allocation would be carried out. This was done to avoid participant confusion about the logistics of how money would be allocated to (a specific version of) the future self. Nevertheless, post-study questioning did not reveal any suspicion about these instructions or that the \$10 incentive would actually be awarded via random draw, nor did we receive any follow-up questions from those who were awarded the incentive. All relevant measures had already been collected before the point at which the participants were informed about the results of the random draw.

trimodal, with most participants choosing to give nothing to the target, but with smaller peaks also occurring at the midpoint (\$5) and the total amount (\$10; see Figure 4). On average, people allocated more money to their future selves ( $M = \$3.50$ ,  $SD = \$3.93$ ) than they did to others ( $M = \$2.79$ ,  $SD = \$3.62$ ;  $t = 6.41$ ,  $p < .001$ ,  $d = 0.17$ ). This difference was largely driven by the smaller proportion of \$0 allocations made to future selves than to others (0.42 vs. 0.50,  $\chi^2 = 17.63$ ,  $p < .001$ ) and larger proportion of \$10 allocations made to future selves vs. others (0.21 vs. 0.14,  $\chi^2 = 19.60$ ,  $p < .001$ ). Otherwise, the general pattern of distributions was quite similar.

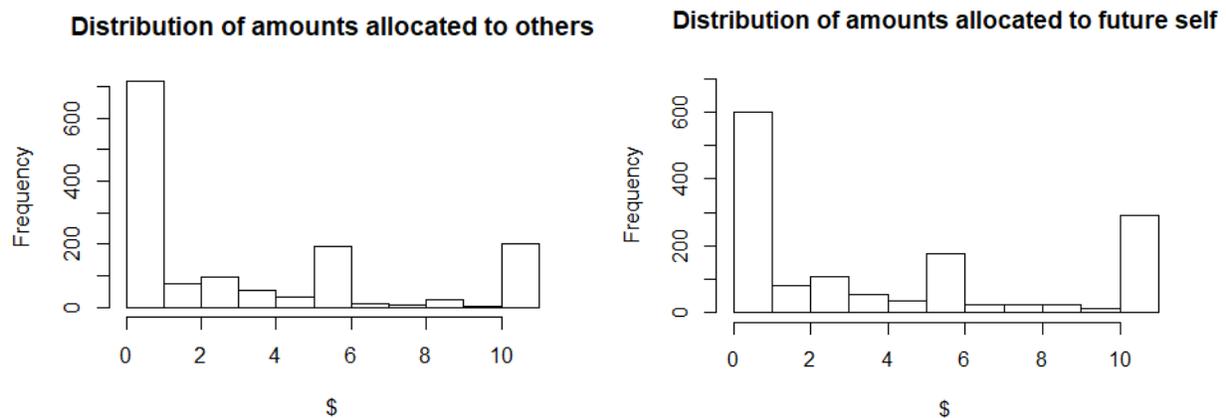


Figure 4. Distribution of amounts allocated to others and future self in Study 2.

### 3.3.2. Manipulation of characteristics

As a manipulation check, we performed an analysis to ensure that participants generated targets with characteristics spanning the range of high and low levels without being confounded with target type. We found some small differences in mean levels of characteristics between the two target types, but in all cases, the means for all conditions intended to have high levels of characteristics were higher than the means for all conditions intended to have low levels of characteristics (see Table 2). These differences indicate that our manipulation was successful in evoking both interpersonal and intrapersonal targets spanning both high and low levels of each characteristic.

LIKING	SIMILARITY
M diff high vs. low = 55.29, 95% CI=[52.49, 58.09]	M diff high vs. low = 29.59, 95% CI=[26.64, 32.53]
M diff self vs. other = -0.81, 95% CI=[-3.52, 1.89]	M diff self vs. other = -2.24, 95% CI=[1.42, 12.09]
Contrast of differences: $t(723) = 54.48, p < .001, d = 1.22$	Contrast of differences: : $t(683) = 15.58, p < .001, d = .60$
NEED	DESERVINGNESS
M diff high vs. low = 51.33, 95% CI=[48.26, 54.39],	M diff high vs. low = 47.57, 95% CI=[44.50, 50.64]
M diff self vs. other = -1.11, 95% CI=[-4.19, 1.98]	M diff self vs. other = -1.24, 95% CI=[-3.82, 1.34],
Contrast of differences: $t(719) = 23.28, p < .001, d = 0.87$	Contrast of differences: $t(735) = 23.70, p < .001, d = 0.87$

Table 2. For all characteristics in Study 2, the overall magnitude of differences due to manipulation (high – low conditions) is significantly larger than for differences due to intrapersonal or interpersonal target type (self – other conditions) at the  $p < .001$  level.

### 3.3.3. Effects of target characteristics

Four continuous variables representing the participant’s ratings of each characteristic of interest (liking, need, similarity, and deservingness), a binary variable representing the type of target (future self vs. other), and all two-way interactions between characteristics and target type were entered into a linear regression predicting each allocation amount. Ratings of all four target characteristics were centered before entering them into the regression, and we ran a multilevel model, with targets nested within participants. The participant-generated ratings (0-100) for all four characteristics (liking, similarity, need, deservingness) were used as predictors.

For our primary analysis, we used participants’ ratings of the characteristics—rather than codes for the conditions to which they were assigned—as predictors of allocations, for several reasons. First, participants were asked for ratings of all four characteristics for each target despite the fact that only two characteristics for any given participant were manipulated. Using participants’ own ratings provides predictor values corresponding to all four characteristics of interest for each target for each allocation they made. In contrast, using assigned condition as the predictor would only provide information about two characteristics for each target. Also, the continuous rather than categorical nature of the ratings allows for more fine-grained distinctions

than would be provided by using a binary indicator of assigned (high/low) condition. In our pilot validation tests of these measures (see Pilot Studies 4-5 in Appendix A) we found both that these ratings are appropriately sensitive to the targeted manipulations, and that the ratings across target types are comparable.

The analysis suggests that people's allocations to each target are sensitive to each of the four characteristics as well as the type of target (other or self; see Table 3). For each 1-unit increase on the 100-point rating scale, participants allocated an additional 1.6 cents to targets for increases in liking, 0.54 cents for increases in similarity, 1.1 cents for increases in need, and 3.0 cents for increases in deservingness.

Overall, Study 2 reveals that, in line with participants' self-reported ratings of importance in Study 1, deservingness is a highly influential factor for allocations to both the future self and other people. However, whereas the perceived influence of need and deservingness on allocations were similar in Study 1, Study 2 suggests that, at least for the particular monetary amounts used, need has a relatively lower (though still significant) impact on allocations. The influence of liking appears comparable to need, and the influence of similarity is quite weak overall.

<b>Study 2 Regression Model Fixed Effects</b>						
<i>Effect</i>	<i>Estimate</i>	<i>Std. Err</i>	<i>Df</i>	<i>t value</i>	<i>p value</i>	<i>Marginal R<sup>2</sup></i>
Intercept	2.74	.1183	568	23.19	<.001	
Liking (mean-centered)	.016	.0037	2675	4.26	<.001	.005
Similarity (mean-centered)	.0054	.0033	2696	1.63	.103	.001
Need (mean-centered)	.011	.0023	2665	4.93	<.001	.007
Deservingness (mean-centered)	.0299	.0035	2667	8.43	<.001	0.020
Target (0=other, 1=self)	.8078	.1095	2490	7.38	<.001	0.014
Liking*Target	-.009	.0050	2624	-1.87	.061	.001
Similarity*Target	.005	.0046	2667	1.09	.277	.000
Need*Target	.004	.0032	2593	1.16	.247	.000
Deservingness*Target	-.004	.0048	2594	-0.82	.412	.000

Table 3: Fixed effects estimates from Study 2 regression model: Main effect and interactions.

Notably, even after accounting for all four factors, there remains a sizeable effect of target type (81 cents increased allocation to the future self compared to others). In other words, there is a quite large remaining difference between future selves and others that affects allocations and is *not* being captured by differences in any of the four characteristics measured.

This model also tests whether the influence of each characteristic on allocations differed based on the type of target being considered. No significant interactions were found between target and any of the four characteristics of interest. This suggests that although people generally allocate more to the future self than they do to others, the influence of the four characteristics is relatively similar for both types of decisions. Supporting the lack of significant impact of these target \* characteristic interaction terms on allocations, comparison of the Bayes factors for the full model (above) with a main effects only model indicated that the more parsimonious model better fits the data (BF main / BF full= 186.11). So, results of the main effects only model are presented in Table 4. We observe that coefficients are nearly identical to those of the full model, though similarity now becomes a significant predictor of allocations. Graphical representations of the effect of change in each characteristic on allocations to the future self and others is provided in Figure 5.

<b>Study 2 Regression Model Fixed Effects</b>						
<i>Effect</i>	<i>Estimate</i>	<i>Std. Err</i>	<i>Df</i>	<i>t value</i>	<i>p value</i>	<i>Marginal R<sup>2</sup></i>
Intercept	2.75	.1184	569	23.20	<.001	
Liking (mean-centered)	.011	.0026	2675	4.18	<.001	.005
Similarity (mean-centered)	.0081	.0023	2737	3.48	<.001	.004
Need (mean-centered)	.013	.0017	2728	7.83	<.001	.018
Deservingness (mean-centered)	.0279	.0025	2751	10.97	<.001	0.035
Target (0=other, 1=self)	.8073	.1100	2494	7.37	<.001	0.014

Table 4: Fixed effects estimates from Study 2 regression model: Main effects only.

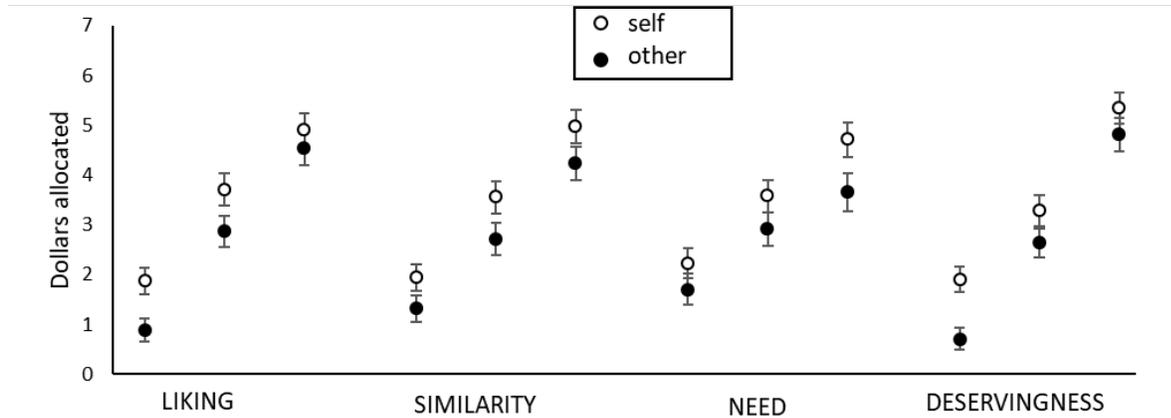


Figure 5. Effect of each characteristic on allocations to future self and other in Study 2. Dots are located at the midpoint of each tertile for ratings of each characteristic across all targets. Error bars represent 95% CI.

As a robustness check, we ran a second analysis using assigned condition (i.e., high versus low level of characteristics) as predictors of allocated amounts, rather than participants' ratings. Because only two of four characteristics were manipulated for each target, we created a contrast code that took on a value of 1 for targets that were assigned to high levels of that characteristic, -1 for targets that were assigned to low levels of that characteristic, and 0 for targets where that characteristic was not manipulated.

The results of this follow-up analysis were similar to the primary analysis. People allocated a significantly greater amount of money to targets with high levels of each characteristic than to those with low levels. Also, they allocated more money to the future self than to others (see Figure 6). The interaction results were directionally consistent with the primary analysis, although this second analysis revealed significant target\*liking ( $B = -0.741$ ,  $t(2491) = -4.92$ ,  $p < .001$ ) and target\*deservingness ( $B = -0.561$ ,  $t(2491) = -3.76$ ,  $p < .001$ ) interactions. These interactions reflected the pattern that people allocated more money to their low-liking, low-deservingness future selves than to the low-liking, low-deservingness acquaintances (see Appendix E for full results). This suggests that liking and deservingness may be slightly less influential as determinants of allocations to future selves low on these characteristics. However, the general pattern of results is similar to those obtained using the continuous measures (as can be observed by comparing Figure 5 and Figure 6), and people's allocations are responsive to changes in liking and deservingness for both types of targets.

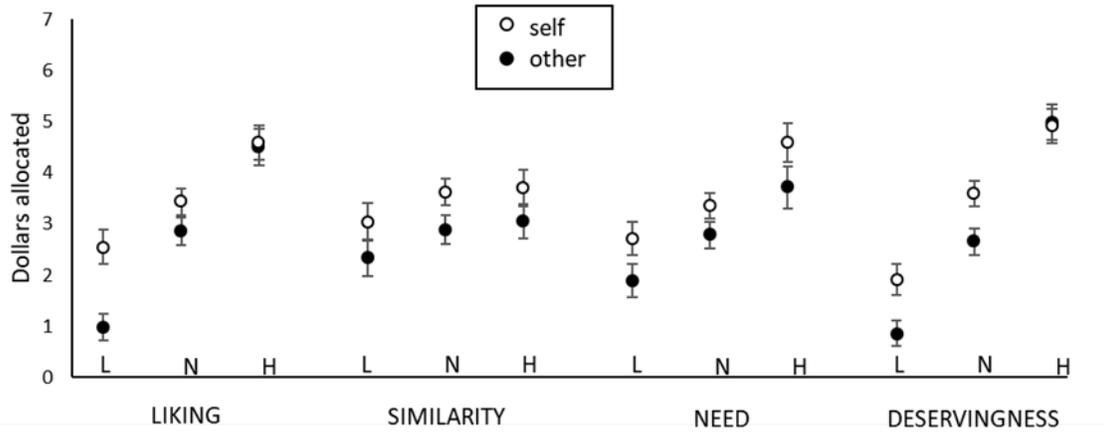


Figure 6. Mean allocations to future self and other in low (L), high (H), and non-manipulated (N) conditions for each characteristic in Study 2. Error bars represent 95% CI.

### 3.4. Study 2 Summary

Study 2 reveals two key patterns. First, people treat the future self *much like they treat others*, insofar as allocations to the future self and to others appear similarly sensitive to the factors tested. Second, people consistently treat the future self *differently than others*, insofar as they give far more to their future selves than others. Thus, people's decision policies for the self and other are similar in the way they use the factors of deservingness, need, liking, and similarity to make allocation decisions. However, large differences in allocation amounts remain even after controlling for these factors.

## 4. General discussion

The studies in this paper bridge research on interpersonal and intrapersonal allocations by examining to what extent people focus on the same factors when assigning benefits to another person or the future self. The current research provides the first direct test of the relative influence of these factors when considered jointly—for either interpersonal allocation decisions (e.g., the dictator game) or for intrapersonal allocation decisions (e.g., temporal discounting)—by carefully separating and examining the influence of each characteristic while controlling for the others.

### 4.1. Parallels between future selves and others

In some ways, people seem to treat future selves in much the same way that they treat others. People reported factors related to need, deservingness, liking, and similarity as

comparably influential across both types of targets (Study 1), and used these characteristics similarly when making allocations (Study 2). We found that deservingness is the most influential factor, followed by need and liking with a smaller but significant effect, and finally similarity.

The fact that people are similarly responsive to changes in these characteristics for both the self and other suggests that, in some respects, the “future-self-as-other” analogy proposed in multiple selves frameworks may be useful. In particular, our findings are consistent with the idea that decisions involving future selves and others stem from similar decision policies, as demonstrated by the comparable pattern of specific characteristics that influenced allocations. One potential practical implication of these findings is that similar interventions may be successful for both types of targets.

For example, some research explores mechanisms of and methods for promoting empathy to increase interpersonal helping behavior (e.g., Batson et al., 1997; Batson et al., 2003; Campbell, O’Brien, Van Boven, Schwarz, & Ubel, 2014; Gutsell & Inzlicht, 2012; Hein, Silani, Preuschoff, Batson, & Singer 2010; Lamm, Batson, & Decety, 2007; O’Brien & Ellsworth, 2012). Our findings support the idea that some of the methods used to increase empathy for others (e.g., highlighting need or similarity; Dickert, Sagara, & Slovic, 2011; Mayo & Tinsley, 2009; Zarghamee et al., 2017) could similarly be used to increase empathy toward future selves. In fact, related methods have been implemented in recent research (e.g. increasing vividness of the future self; Hershfield, John, & Reiff, 2018; increasing feelings of responsibility toward the future self; Bryan & Hershfield, 2012). This approach shows promise in encouraging future-oriented behaviors, including saving and retirement planning (Bryan & Hershfield, 2012; Ersner-Hershfield et al., 2009).

#### *4.2. Distinctions between future selves and others*

However, despite the finding that changes in liking, similarity, need, and deservingness seem to have a similar impact on interpersonal and intrapersonal resource allocations, we observed that people give larger amounts overall to their future selves than to others. In other words, future selves are *not* treated like others when it comes to the baseline amount allocated to them. This suggests that there seems to be something more to the future self than the simplified statement that it is “treated like another person.”

If not differences in target characteristics, what explains the overall increase in giving we observed for the future self compared to others? The advantage conferred to the future self likely

has many antecedents. For example, even if a future self and another person could somehow be perfectly equated on all important personal characteristics, people might inherently perceive a certain special quality of “selfness” that cannot be reduced to any other characteristic or description, or they might follow a general norm of pursuing their self-interest that is unrelated to specific characteristics of that future self. Examining these possibilities within a controlled resource allocation framework similar to the one presented here is a worthwhile avenue for future research.

#### *4.3 Limitations and future directions*

Our research provided a direct test of how much allocations are affected by the four factors of liking, similarity, need, and deservingness studied in a controlled context. In other words, each of the four factors was expressly manipulated to provide as close a match as possible between the intrapersonal (future self) and interpersonal (other person) targets being compared. The benefit of this approach is that it allows us to effectively examine the influence of each factor while minimizing confounds. However, we expect that in a less controlled context, people will vary in how much they naturally consider these factors. For example, though we found that people’s intrapersonal and interpersonal allocations vary in a similar fashion in response to specific differences in liking, it is possible that people are less prone to spontaneously consider how much they like the future self unless prompted. So, the influence of this factor in real-world intrapersonal (vs. interpersonal) allocations may be diminished compared to our experimental findings. Future research can examine how much our findings apply in settings where the participant’s attention is not explicitly drawn to specific characteristics of the target before the allocation.

Our studies also only considered a single allocation per target. Another area for future exploration includes how allocations in turn reciprocally affect future evaluations of the target. For example, an allocation made toward a needy target will itself reduce the need of this target going forward. So, another relevant future stream of research can explore how people approach decisions related to multiple allocations in time (e.g., repeated contributions to a retirement plan).

#### *4.4. Conclusion*

Overall, we find that although the future self is treated differently from the current self, it is not treated exactly like a third party is treated. This suggests that the “future-self-as-other”

analogy used in many existing frameworks should be applied with caution. Previous research has highlighted that people may think of their own identity on a continuum, when assessed in terms of perceived similarity between the present and future self (e.g., Bartels & Rips, 2010; Ersner-Hershfield et al., 2009; Heiphetz, Strohminger, & Young, 2017; Molouki & Bartels, 2017; O'Brien & Kardas, 2016). The current results support this possibility and also highlight the importance of factors other than perceived similarity that affect resource allocations to the future self. Rather than simply describing the future self as “another person,” researchers might benefit from considering how the continuum of concern for future self is similar to or different from the continuum of concern for others. Our findings highlight that issues related to identity continuity over time and the self-other distinction—in addition to their philosophical interest—can have important consequences for real decisions and behavior.

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## Appendix A: Pilot Studies

### *Pilot Study 1 Prompts*

#### Prompt for interpersonal target:

"In this study, you will be asked to speak aloud to us about the factors that would be important to you in deciding whether to give some money to another person and how much to give them. Imagine that you are presented with the following scenario - you are given \$10[\$50]<sup>4</sup>, and have the opportunity to share any amount of this money with another person if you want to. What factors would you want to know about this other person when deciding whether to share the money, and how much to give to them? Please think of any and all information that you would want to know about this other person, for example, who they are, personal characteristics they may possess, or anything else. Please be as detailed as possible in your response. You may begin now – please go ahead and speak into the microphone as thoughts come to mind."

#### Prompt for intrapersonal target:

"In this study, you will be asked to speak aloud to us about the factors that would be important to you in deciding whether to save some money for the future and how much to save. Imagine that you are presented with the following scenario - you are given \$10[\$50], and have the opportunity to save any amount of this money for yourself for a certain time in the future if you want to. What factors would you want to know about the person you will be at that future time when deciding whether to save the money, and how much to save? Please think of any and all information that you would want to know about your future self, which may involve your situation, personal characteristics you may possess, or anything else. Please be as detailed as possible in your response. You may begin now – please go ahead and speak into the microphone as thoughts come to mind."

### *Pilot Study 1 Results*

	Need	Deservingness	Similarity	Social Distance	Personality
Interpersonal (allocation to other); N=16	15	7	0	5	4
Intrapersonal (allocation to future self); N=15	12	3	1	0	0

Table A.1. Number of participants in Pilot Study 1 mentioning that they would want to consider various types of factors before making an allocation. If a participant listed multiple types of factors, they are counted in all relevant cells.

### *Pilot Study 3 Prompts*

<sup>4</sup> Two different monetary amounts were used, based on random assignment between subjects. Because types of factors named did not differ based on amount, the results of both conditions were combined.

Participants were asked to report the minimum amount of time that would need to pass before they would consider that their future self could significantly change, compared to their current self, on each of the four factors of liking, similarity, need and deservingness. For each of these, participants reported the minimum time period for which they could imagine a significant change in terms of both an increase and a decrease on the relevant dimension compared to the current self (except for similarity, where only a significant decrease in similarity was prompted). For example, the prompts for need were as follows:

Imagine a future version of yourself who has changed a lot in terms of need for money. In other words, the need for money of this "future you" is quite different than your current need for money.

As an example, if we asked the future you questions like "Can you afford to pay for food for your family?" or "Are you behind on bills that provide basic living needs (house, car, heat, etc.)?", the answers would be different than the answers you would give now.

**How far in the future would it need to be for this change to be plausible?** Please answer the questions on the following screens.

[screen break]

*What is the minimum amount of time that needs to pass before you think that future version of you might need money significantly **MORE** than you do now?*

Please select the choice that is closest to your answer.

- 3 months
- 1 year
- 5 years
- 10 years
- 25 years

[screen break]

*What is the minimum amount of time that needs to pass before you think that future version of you might need money significantly **LESS** than you do now?*

Please select the choice that is closest to your answer.

- 3 months
- 1 year

- 5 years
- 10 years
- 25 years

The time periods presented in the answer choices were selected based on computing 10<sup>th</sup>, 30<sup>th</sup>, 50<sup>th</sup>, 70<sup>th</sup>, and 90<sup>th</sup> percentiles based on *N* = 100 participants who participated in an open-ended version of the study.

*Pilot Study 3 Results*

	Cumulative percentage of participants reporting plausible change						
	<i>Need - more</i>	<i>Need - less</i>	<i>Liking - more</i>	<i>Liking - less</i>	<i>Deservingness - more</i>	<i>Deservingness - less</i>	<i>Similarity - less</i>
3 months	29%	23%	13%	25%	28%	24%	6%
1 year	59%	38%	53%	42%	52%	42%	20%
5 years	<b>85%</b>	<b>59%</b>	<b>88%</b>	<b>58%</b>	<b>85%</b>	<b>59%</b>	<b>62%</b>
10 years	95%	82%	94%	71%	97%	72%	87%
25 years	100%	100%	100%	100%	100%	100%	100%

Table A.2. Cumulative percentage of participants in Pilot Study 3 who reported that the future self could plausibly be significantly different from the current self over the specified time period for each dimension listed. Five years was chosen as the common time period for all remaining studies because it was the shortest time period for which at least 50% of participants reported that the future self could be changed over this interval or less for *all* types of change asked about.

*Pilot Study 4-5 Prompts*

Liking/Similarity Condition

**[High Liking/High Similarity, Other]**

We would like you to think of someone you personally know who you like very much and who is very similar to you.

In the first space below, please list the name of this individual (first name or initials only). Please list their name such that you will recognize it if presented to you later in this study.

In the second space below, please list a sentence or two describing this person.

**[High Liking/Low Similarity, Other]**

We would like you to think of someone you personally know who you like very much and who is not at all similar to you.

In the first space below, please list the name of this individual (first name or initials only). Please list their name such that you will recognize it if presented to you later in this study.

In the second space below, please list a sentence or two describing this person.

**[Low Liking/High Similarity, Other]**

We would like you to think of someone you personally know who you do not like at all but who is very similar to you.

In the first space below, please list the name of this individual (first name or initials only). Please list their name such that you will recognize it if presented to you later in this study.

In the second space below, please list a sentence or two describing this person.

**[Low Liking/Low Similarity, Other]**

We would like you to think of someone you personally know who you do not like at all and who is not at all similar to you.

In the first space below, please list the name of this individual (first name or initials only). Please list their name such that you will recognize it if presented to you later in this study.

In the second space below, please list a sentence or two describing this person.

**[High Liking/High Similarity, Self]**

Imagine that you have the opportunity to learn a little bit about the person you will be in 5 years.

You learn that the person you will be in 5 years is someone you would like much more than your current self and who is very similar to your current self. Please take a moment to envision what this version of your future self might be like.

In the first space below, assign a name or short phrase to this future version of yourself. Write something that you would recognize if presented to you later in this study.

In the second space below, please list a sentence or two describing this person.

**[High Liking/Low Similarity, Self]**

Imagine that you have the opportunity to learn a little bit about the person you will be in 5 years.

You learn that the person you will be in 5 years is someone you would like much more than your current self and who is not at all similar to your current self. Please take a moment to envision what this version of your future self might be like.

In the first space below, assign a name or short phrase to this future version of yourself. Write something that you would recognize if presented to you later in this study.

In the second space below, please list a sentence or two describing this person.

**[Low Liking/High Similarity, Self]**

Imagine that you have the opportunity to learn a little bit about the person you will be in 5 years.

You learn that the person you will be in 5 years is someone you would like much less than your current self and who is very similar to your current self. Please take a moment to envision what this version of your future self might be like.

In the first space below, assign a name or short phrase to this future version of yourself. Write something that you would recognize if presented to you later in this study.

In the second space below, please list a sentence or two describing this person.

**[Low Liking/Low Similarity, Self]**

Imagine that you have the opportunity to learn a little bit about the person you will be in 5 years.

You learn that the person you will be in 5 years is someone you would like much less than your current self and who is not at all similar to your current self. Please take a moment to envision what this version of your future self might be like.

In the first space below, assign a name or short phrase to this future version of yourself. Write something that you would recognize if presented to you later in this study.

In the second space below, please list a sentence or two describing this person.

*The remaining conditions below follow the format above, thus, only the portion that differs is listed.*

Liking/Need Condition

**[High Liking/High Need, Other]**

We would like you to think of someone you personally know who you like very much and who is very much in need of money...

**[High Liking/Low Need, Other]**

We would like you to think of someone you personally know who you like very much and who is not at all in need of money...

**[Low Liking/High Need, Other]**

We would like you to think of someone you personally know who you do not like at all and who is very much in need of money...

**[Low Liking/Low Need, Other]**

We would like you to think of someone you personally know who you do not like at all and who is not at all in need of money...

**[High Liking/High Need, Self]**

...You learn that the person you will be in 5 years is someone you would like much more than your current self and who is much more in need of money than your current self...

**[High Liking/Low Need, Self]**

...You learn that the person you will be in 5 years is someone you would like much more than your current self and who is much less in need of money than your current self...

**[Low Liking/High Need, Self]**

...You learn that the person you will be in 5 years is someone you would like much less than your current self and who is much more in need of money than your current self...

**[Low Liking/Low Need, Self]**

...You learn that the person you will be in 5 years is someone you would like much less than your current self and who is much less in need of money than your current self...

Liking/Deservingness Condition

**[High Liking/High Deservingness, Other]**

We would like you to think of someone you personally know who you like very much and who is very deserving of money...

**[High Liking/Low Deservingness, Other]**

We would like you to think of someone you personally know who you like very much and who is not at all deserving of money...

**[Low Liking/High Deservingness, Other]**

We would like you to think of someone you personally know who you do not like at all and who is very deserving of money...

**[Low Liking/Low Deservingness, Other]**

We would like you to think of someone you personally know who you do not like at all and who is not at all deserving of money...

**[High Liking/High Deservingness, Self]**

...You learn that the person you will be in 5 years is someone you would like much more than your current self and who is much more deserving of money than your current self...

**[High Liking/Low Deservingness, Self]**

...You learn that the person you will be in 5 years is someone you would like much more than your current self and who is much less deserving of money than your current self...

**[Low Liking/High Deservingness, Self]**

...You learn that the person you will be in 5 years is someone you would like much less than your current self and who is much more deserving of money than your current self...

**[Low Liking/Low Deservingness, Self]**

...You learn that the person you will be in 5 years is someone you would like much less than your current self and who is much less deserving of money than your current self...

Similarity/Need Condition

**[High Similarity/High Need, Other]**

We would like you to think of someone you personally know who is very similar to you and who is very much in need of money...

**[High Similarity/Low Need, Other]**

We would like you to think of someone you personally know who is very similar to you and who is not at all in need of money...

**[Low Similarity/High Need, Other]**

We would like you to think of someone you personally know who is not at all similar to you and who is very much in need of money...

**[Low Similarity/Low Need, Other]**

We would like you to think of someone you personally know who is not at all similar to you and who is not at all in need of money...

**[High Similarity/High Need, Self]**

...You learn that the person you will be in 5 years is someone who is very similar to you and who is much more in need of money than your current self...

**[High Similarity/Low Need, Self]**

...You learn that the person you will be in 5 years is someone who is very similar to you and who is much less in need of money than your current self...

**[Low Similarity/High Need, Self]**

...You learn that the person you will be in 5 years is someone who is not at all similar to you and who is much more in need of money than your current self...

**[Low Similarity/Low Need, Self]**

...You learn that the person you will be in 5 years is someone who is not at all similar to you and who is much less in need of money than your current self...

Similarity/Deservingness Condition

**[High Similarity/High Deservingness, Other]**

We would like you to think of someone you personally know who is very similar to you and who is very deserving of money...

**[High Similarity/Low Deservingness, Other]**

We would like you to think of someone you personally know who is very similar to you and who is not at all deserving of money...

**[Low Similarity/High Deservingness, Other]**

We would like you to think of someone you personally know who is not at all similar to you and who is very deserving of money...

**[Low Similarity/Low Deservingness, Other]**

We would like you to think of someone you personally know who is not at all similar to you and who is not at all deserving of money...

**[High Similarity/High Deservingness, Self]**

...You learn that the person you will be in 5 years is someone who is very similar to you and who is much more deserving of money than your current self...

**[High Similarity /Low Deservingness, Self]**

...You learn that the person you will be in 5 years is someone who is very similar to you and who is much less deserving of money than your current self...

**[Low Similarity/High Deservingness, Self]**

...You learn that the person you will be in 5 years is someone who is not at all similar to you and who is much more deserving of money than your current self...

**[Low Similarity/Low Deservingness, Self]**

...You learn that the person you will be in 5 years is someone who is not at all similar to you and who is much less deserving of money than your current self...

Need/Deservingness Condition

**[High Need/High Deservingness, Other]**

We would like you to think of someone you personally know who is very much in need of money and who is very deserving of money...

**[High Need/Low Deservingness, Other]**

We would like you to think of someone you personally know who is very much in need of money and who is not at all deserving of money...

**[Low Need/High Deservingness, Other]**

We would like you to think of someone you personally know who is not at all in need of money and who is very deserving of money...

**[Low Need/Low Deservingness, Other]**

We would like you to think of someone you personally know who is not at all in need of money and who is not at all deserving of money...

**[High Need/High Deservingness, Self]**

...You learn that the person you will be in 5 years is someone who is much more in need of money than your current self and who is much more deserving of money than your current self...

**[High Need/Low Deservingness, Self]**

...You learn that the person you will be in 5 years is someone who is much more in need of money than your current self and who is much less deserving of money than your current self...

**[Low Need/High Deservingness, Self]**

...You learn that the person you will be in 5 years is someone who is much less in need of money than your current self and who is much more deserving of money than your current self...

**[Low Need Low Deservingness, Self]**

...You learn that the person you will be in 5 years is someone who is much less in need of money than your current self and who is much less deserving of money than your current self...

*Pilot Study 4 Results*

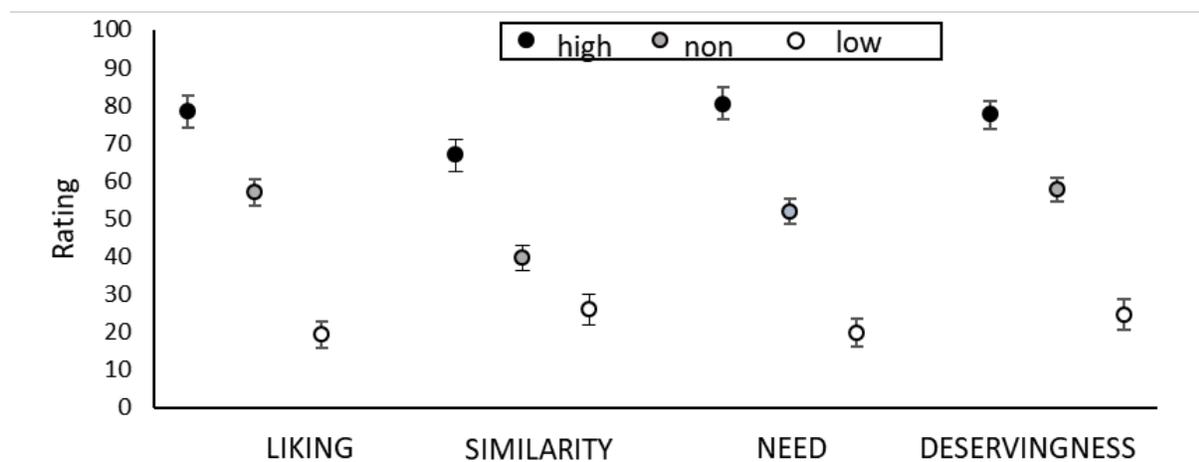


Figure A.1. Mean rating and 95% CI for each characteristic in high, low, and non-manipulated conditions in Pilot Study 4 (results collapsed across ratings of both self and other, which did not significantly differ).

Manipulated Factor:	LIKING	SIMILARITY	NEED	DESERVINGNESS
Effect of manipulations on targeted factor				
	<i>Liking</i> M diff = 59.12 <i>paired-t</i> (92) = 16.38 <i>p</i> <.001, <i>d</i> = 1.70	<i>Similarity</i> M diff = 40.75 <i>paired-t</i> (88) = 11.00 <i>p</i> <.001, <i>d</i> = 1.17	<i>Need</i> M diff = 60.71 <i>paired-t</i> (89) = 16.89 <i>p</i> <.001, <i>d</i> = 1.78	<i>Deservingness</i> M diff = 52.93 <i>paired-t</i> (87) = 15.28 <i>p</i> <.001, <i>d</i> = 1.63
Effect of manipulations on non-targeted factors				
	<i>Similarity</i> M diff = 32.26 <i>paired-t</i> (92) = 9.60, <i>p</i> <.001, <i>d</i> =1.00	<i>Liking</i> M diff = 15.80 <i>paired-t</i> (88) = 5.66, <i>p</i> <.001, <i>d</i> =0.60	<i>Liking</i> M diff = -8.52 <i>paired-t</i> (89) = -2.55, <i>p</i> =.012, <i>d</i> =0.27	<i>Liking</i> M diff = 28.38 <i>paired-t</i> (187) = 8.41, <i>p</i> <.001, <i>d</i> =0.90
	<i>Need</i> M diff = 2.46 <i>paired-t</i> (92) = 0.78, <i>p</i> =.44, <i>d</i> =0.08	<i>Need</i> M diff = 3.20 <i>paired-t</i> (88) = 1.26, <i>p</i> =0.21, <i>d</i> =0.13	<i>Similarity</i> M diff = -1.31 <i>paired-t</i> (89) = -0.46, <i>p</i> =0.64, <i>d</i> =0.05	<i>Similarity</i> M diff = 19.93 <i>paired-t</i> (87) = 7.35, <i>p</i> <.001, <i>d</i> =0.78
	<i>Deservingness</i> M diff = 30.70 <i>paired-t</i> (92) = 10.22, <i>p</i> <.001, <i>d</i> =1.06	<i>Deservingness</i> M diff = 10.50 <i>paired-t</i> (88) = 4.27, <i>p</i> <.001, <i>d</i> =0.45	<i>Deservingness</i> M diff = 5.69 <i>paired-t</i> (89) = 2.10, <i>p</i> =0.04, <i>d</i> =0.22	<i>Need</i> M diff = -6.00 <i>paired-t</i> (87) = -1.54, <i>p</i> =0.13, <i>d</i> =0.16

Table A.3. Effects of high vs low manipulations on both targeted and non-targeted factors in Pilot Study 4 (combines ratings of future selves and others)

Type of factor	LIKING	SIMILARITY	NEED	DESERVINGNESS
MANIPULATED Factors	1918.4	1394.7	1933.1	1605.0
NON-MANIPULATED Factors	1173.7	1122.3	1016.8	1016.5
<i>T</i>	5.19	2.14	6.30	4.32
<i>P</i>	<.001	.034	<.001	<.001

Table A.4. Mean within-subjects variance among ratings of target individuals for manipulated and non-manipulated factors in Pilot Study 4. Rating of each characteristic was made on a 0-100 scale.

	Liking	Similarity	Need	Deservingness
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Liking	--	0.54 ***	0.26***	0.70***
Similarity		--	0.66 ***	0.55 ***
Need			--	0.25***

Table A.5. Average within-subject correlations for ratings of all characteristics in Pilot Study 4; Ratings of others

	Liking	Similarity	Need	Deservingness
Liking	--	0.66 ***	-0.14*	0.50 ***
Similarity		--	0.03	0.43 ***
Need			--	-0.04

Table A.6. Average within-subject correlations for ratings of all characteristics in Pilot Study 4; Ratings of future selves

	Manipulated Factor →	Liking	Similarity	Need	Deservingness
Ratings					
Liking		0.77 ***	0.30 ***	-0.14 *	0.43 ***
Similarity		0.52 ***	0.62 ***	-0.04	0.36 ***
Need		0.09	0.07	0.78 ***	-0.14 *
Deservingness		0.51 ***	0.21 ***	0.13 *	0.77 ***

Table A.7. Average within-subjects point-biserial correlations between manipulations (high = 1, low = 0) and ratings in Pilot Study 4 (combines ratings of future selves and others)

### *Pilot Study 5 Results*

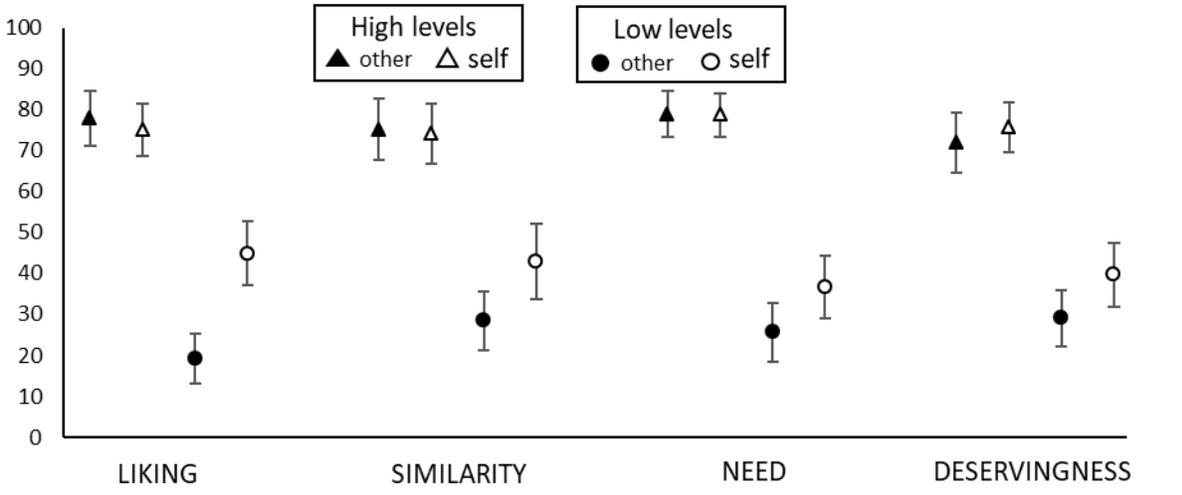


Figure A.2. Ratings of each characteristic in plotted by condition (high versus low) and target type (future self versus other) in Pilot Study 5. Error bars represent 95% CI.

LIKING	SIMILARITY
M diff high vs. low = 44.41, 95% CI=[38.02, 50.81]	M diff high vs. low = 39.00, 95% CI=[32.24, 45.76]
M diff self vs. other = 11.37, 95% CI=[6.22, 16.52]	M diff self vs. other = 6.76, 95% CI=[1.42, 12.09]
Contrast of differences: $t(163) = 7.68, p < .001$	Contrast of differences: $t(139) = 6.91, p < .001$
NEED	DESERVINGNESS
M diff high vs. low = 47.66, 95% CI=[41.19, 54.12],	M diff high vs. low = 39.45, 95% CI=[32.99, 45.91]
M diff self vs. other = 5.49, 95% CI=[0.90, 10.09]	M diff self vs. other = 7.24, 95% CI=[3.08, 11.40],
Contrast of differences: $t(159) = 8.97, p < .001$	Contrast of differences: $t(167) = 3.43, p < .001$

Table A.8. For all characteristics in Pilot Study 5, overall differences due to manipulation (high – low conditions) are significantly larger than differences due to intrapersonal or interpersonal target type (self – other conditions) at the  $p < .001$  level. All  $p$  values remain at  $p < .001$  when using a Bonferroni correction for multiple comparisons.

## Appendix B: Additional results from Study 1

### *Results of Study 1 considering only the FIRST target presented to each participant*

Across both types of targets, information about both need and deservingness (mean importance = 5.66, SD = 1.21) was consistently considered to be more important than information about both liking and similarity (mean ranking = 3.34, SD = 1.21), as confirmed by a Wilcoxon signed-rank test ( $W = 45350$ ,  $p < .001$ ; see Figure B.1, where importance is displayed as the reverse score of participant's rankings).

Also, there was a significant target\*question interaction,  $F(7, 2282)=4.06$ ,  $p<.001$  ( $p=.002$  after Greenhouse-Geisser sphericity correction),  $\eta_p^2=.012$ , and target\*category interaction  $F(3, 987)=5.06$ ,  $p=.002$  ( $p=.004$  after Greenhouse-Geisser sphericity correction),  $\eta_p^2=.015$ , on the participants' rankings. This suggests that people assigned different patterns of usefulness to the different types of information based on whether they were thinking about an allocation to the future self versus to another person. When the target recipient was the future self, people reported that information about need (Wilcoxon rank sum test,  $W = 11512$ ,  $p = 0.022$ ) and similarity ( $W = 10786$ ,  $p=.002$ ) was relatively more important compared to when the target was another person, (see Figure 3). In contrast, when the target recipient was another person, people reported that information about deservingness ( $W = 15445$ ,  $p = 0.019$ ) and liking ( $W = 15700$ ,  $p = 0.008$ ) was relatively more important than when the target was the future self. However, as can be seen from the figure, these target-driven differences were much smaller in magnitude than the common difference in importance between need/deservingness and liking/similarity across both types of targets. Furthermore, when looking at the whole dataset (i.e., without excluding the second target rated) the mean within-subjects Spearman's rank-order correlation between importance ratings of each factor for others and the same factor for future selves was  $r_s = 0.518$  (excludes data from one participant whose importance ratings had zero variance). This indicates a moderately high degree of agreement between the pattern of characteristics a given individual considers to be important for evaluating others and future selves.

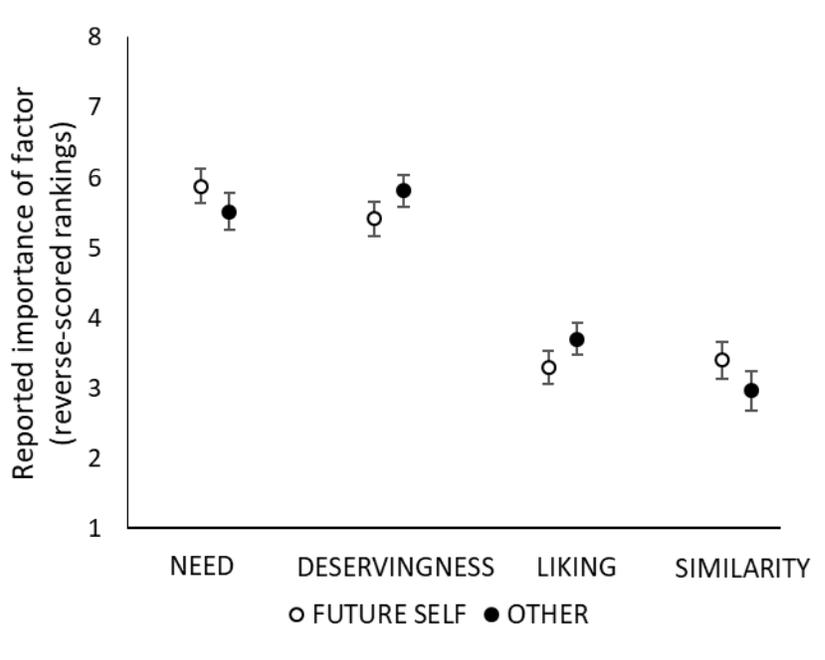


Figure B.1 Participant ratings from Study 1 of how important each factor would be to them when making a decision about an allocation to future self or another person. Importance is displayed as the average ranking (on a 1-8 scale) of the two questions representing that factor. The above figure considers only the first target presented to each participant. Rankings are reverse-scored such that higher numbers indicate greater perceived importance. Error bars are 95% CIs.

## Appendix C: Additional information for Study 2

Sample participant descriptions from Study 2 of future self and other, by condition:

### Liking/Similarity Condition

#### **[High Liking/High Similarity Future Self]**

“[name] is successful, a good mom and a happy person”

#### **[High Liking/Low Similarity Future Self]**

“[name] is very thin, loves to workout and eat right”

#### **[Low Liking/High Similarity Future Self]**

“Keeps to himself with few friends”

#### **[Low Liking/Low Similarity Future Self]**

“This person failed to some sort of addiction and never met full potential”

#### **[High Liking/High Similarity Other]**

“She is sweet and kind, and has the same passion and dreams as me.”

#### **[High Liking/Low Similarity Other]**

“This is my sister. We are nothing alike but I like who she has become”

#### **[Low Liking/High Similarity Other]**

“He has many of the same qualities and dreams of me, but he is not really a good person and is not nice to people.”

#### **[Low Liking/Low Similarity Other]**

“She is very loud and aggressive, the complete opposite of myself.”

### Liking/Need Condition

#### **[High Liking/High Need Future Self]**

“carefree, independent, struggling, making ends meet”

#### **[High Liking/Low Need Future Self]**

“Happy successful law school grad who gets high paying job and doesn't hate job.”

#### **[Low Liking/High Need Future Self]**

“Broke and alone has worked for whole life for others benefits and now feels abandoned. She put her children's education before her own financial well-being and now is suffering economically. She is depressed and alone. She no longer has her house because she cannot afford the maintenance and living in a rental. She cannot get public assistance because her income is right on that threshold so she doesn't eat healthy and now her health is suffering.”

**[Low Liking/Low Need Future Self]**

“Rich Philanthropist. but sociopath”

**[High Liking/High Need Other]**

“She is hardworking but lost her job due to illness.”

**[High Liking/Low Need Other]**

“[name] worked his entire life and saved/invested wisely. Today, [name] is a millionaire from starting as a clerk. Proud man.”

**[Low Liking/High Need Other]**

“[name] overextended himself. He is an angry, egotistical man. At one point he had ample finances to live out his life, but made many foolish purchases and now does not have two nickels to rub together.”

**[Low Liking/Low Need Other]**

“They are gainfully employed as a programmer. Their personal views are disgusting and I find them unpleasant in social situations.”

Liking/Deservingness Condition

**[High Liking/High Deservingness Future Self]**

“Hardworking and honest business woman. Always look out for my employees.”

**[High Liking/Low Deservingness Future Self]**

“Lots of friends, but not doing anything that pays the bills.”

**[Low Liking/High Deservingness Future Self]**

“If she's a worse person but more deserving of money, then she probably spends all her time working and doesn't much care about anything except getting ahead.”

**[Low Liking/Low Deservingness Future Self]**

“This sounds like a version of me who just keeps mooching off my parents forever and never goes anywhere or does anything.”

**[High Liking/High Deservingness Other]**

“This person has worked hard to get a Ph.D. and is a really nice person. They are struggling financially and deserve a better job and more money.”

**[High Liking/Low Deservingness Other]**

“This person is a nice person, but sometimes gets themselves into bad habits, etc., and it really affected their position in life, career-wise.”

**[Low Liking/High Deservingness Other]**

“[name] is incredibly annoying and loud, and creates tension in the workplace. However, she is very hard working and her projects are very successful.”

**[Low Liking/Low Deservingness Other]**

“[name] is a two-faced person who has constantly stepped on others to get to the position that she is in. She has everything handed to her and is overall very snobbish.”

Similarity/Need Condition

**[High Similarity/High Need Future Self]**

“I would be living in Texas and going to school attending college. Although I am struggling I am making ends meet.”

**[High Similarity/Low Need Future Self]**

“The what I expect version of myself has worked hard and kept a positive attitude. With a little luck they have become a version of themselves that is set financially.”

**[Low Similarity/High Need Future Self]**

“They would be desperate for money and probably shoplifting to survive.”

**[Low Similarity/Low Need Future Self]**

“[name] is mean to everyone. She is snobby since she got a promotion at her job and makes far more money than those around her.”

**[High Similarity/High Need Other]**

“[name] is a student and struggling. She just lost her job and trying to make ends meet and to move back in with her mother.”

**[High Similarity/Low Need Other]**

“one of my really good friends but with lots of money”

**[Low Similarity/High Need Other]**

“Old biker dude who has no job and is likely still addicted to hard drugs”

**[Low Similarity/Low Need Other]**

“[name] is extroverted and loud. He has a great income doing stand-up comedy across the country.”

Need/Deservingness Condition

**[High Need/High Deservingness Future Self]**

“I would be hardworking, family-oriented, and intelligent. Maybe stuck at a job I don't enjoy.”

**[High Need/Low Deservingness Future Self]**

“I'm in need of money because I assaulted a woman in walmart, went to prison, got out, but now can't get a job, so i am a pickpocket.”

**[Low Need/High Deservingness Future Self]**

“She worked for what she has. she deserves to be comfortable”

**[Low Need/Low Deservingness Future Self]**

“This person isn't as hardworking as they used to be, and may have grown to be lazy.”

**[High Need/High Deservingness Other]**

“[name] has worked hard all of her life and is recently widowed. She doesn't have much money but still gives what little money she has to her grandchildren.”

**[High Need/Low Deservingness Other]**

“This person is not at all honest. They move from home to home taking advantage of people's kindness, then being disrespectful to them.”

**[Low Need/High Deservingness Other]**

“Does not need money but is well deserving of the money, they are nice friendly and always willing to help in a time of need”

**[Low Need/Low Deservingness Other]**

“Unmotivated, but living with their family as a security blanket, they don't work because they're supported in all financial ways.”

Similarity/Deservingness Condition

**[High Similarity/High Deservingness Future Self]**

“[name] is a man of great virtue and is heavily committed to his community’s welfare.”

**[High Similarity/Low Deservingness Future Self]**

“This person makes no effort to try to support themselves and shirks their duties.”

**[Low Similarity/High Deservingness Future Self]**

“This future version of me has become influential, confident, persuasive, and has a figurative silver tongue. Ambitious Me has worked hard and figured out how to rise up in the company or has started their own business.”

**[Low Similarity/Low Deservingness Future Self]**

“Has a black heart that is hard. Has no emotions and only cares for self.”

**[High Similarity/High Deservingness Other]**

“[name] is a hard-worker and has worked on key part of our software. If it were possible to pay him more money he definitely deserves it.”

**[High Similarity/Low Deservingness Other]**

“This person was born with a silver spoon in their mouth so they just expect things to be handed to them.”

**[Low Similarity/High Deservingness Other]**

“[name] is an entrepreneur who started a successful business by himself. He is smart and resourceful.”

**[Low Similarity/Low Deservingness Other]**

“This person works while mooching off the government and doesn't do much else with their life.”

Please answer the questions below about both of these people on the scale provided.

Do you like this person?	<p><b>Liked future self</b></p> <p>Not at all                      Very much</p> 	<p><b>John Smith</b></p> <p>Not at all                      Very much</p> 
	<p><b>Liked future self</b></p> <p>Not at all                      Very much</p> 	<p><b>John Smith</b></p> <p>Not at all                      Very much</p> 
Is this person in need of money?	<p><b>Liked future self</b></p> <p>Not at all                      Very much</p> 	<p><b>John Smith</b></p> <p>Not at all                      Very much</p> 
	<p><b>Liked future self</b></p> <p>Not at all                      Very much</p> 	<p><b>John Smith</b></p> <p>Not at all                      Very much</p> 
Is this person deserving of money?	<p><b>Liked future self</b></p> <p>Not at all                      Very much</p> 	<p><b>John Smith</b></p> <p>Not at all                      Very much</p> 

Figure C.1. Sample screenshot for rating characteristics of future self and other in Study 2.

**Appendix D: Comparison of hypothetical and incentive compatible versions of Study 2**

<b>Study 2: Fixed effect estimates by target, factor, and study version</b>					
	<i>Estimate</i>	<i>Std. Error</i>	<i>Df</i>	<i>t value</i>	<i>p value</i>
Intercept	2.91	.168	568	17.32	<.001
Study (0= hypothetical, 1= incentive compatible)	-0.32	.236	567	-1.35	.177
Liking (mean-centered)	.010	.0036	2749	2.83	.005
Similarity (mean-centered)	.0087	.0032	2739	2.68	.007
Need (mean-centered)	.015	.0024	2716	6.44	<.001
Deservingness (mean-centered)	.031	.0036	2760	8.74	<.001
Target (0=other, 1=self)	.654	.156	2490	4.20	<.001
Target*Study	0.30	.219	2489	1.39	.166
Liking*Study	.001	.0052	2747	0.264	.792
Similarity*Study	-.0008	.0047	2731	-0.191	.849
Need*Study	-.004	.0033	2723	-1.26	.208
Deservingness*Study	-.007	.0051	2746	-1.42	.157

Table D.1: Model showing effects of study, study\*target, and study\*factor interactions across both versions of Study 2

Study 2a: Hypothetical allocations

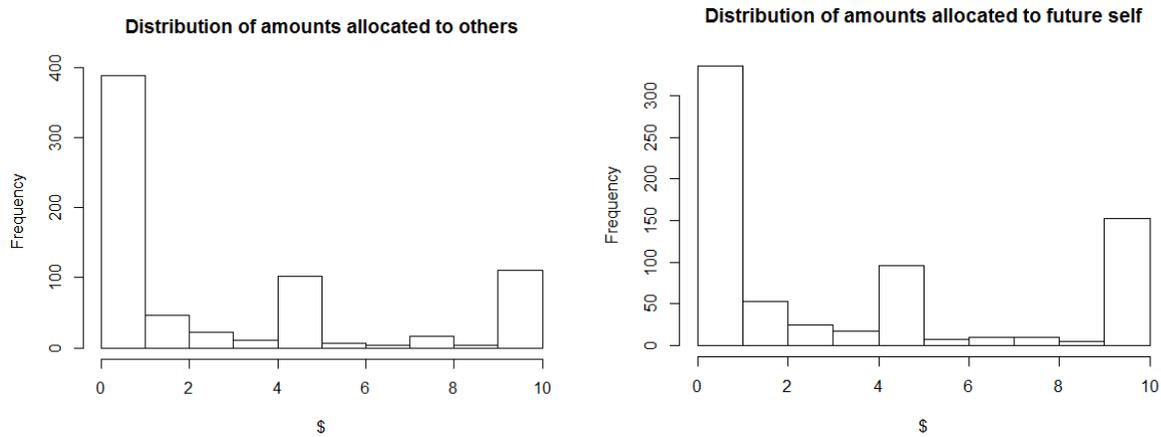


Figure D.1. Distribution of amounts allocated to others and future self in Study 2a.

Characteristic	Mean (SD) level of characteristic across high conditions	Mean (SD) allocation for high levels of characteristic	Mean (SD) level of characteristic across low conditions	Mean (SD) allocation for low levels of characteristic
Liking	83.95 (22.73)	4.615 (3.932)	27.64 (31.06)	1.910 (3.234)
Similarity	63.79 (30.83)	3.362 (3.796)	35.12 (31.48)	2.533 (3.536)
Need	81.12 (25.52)	4.239 (4.225)	29.46 (33.73)	2.424 (3.622)
Deservingness	76.09 (29.08)	5.314 (3.911)	30.88 (32.86)	1.471 (2.734)

Table D.2. Mean amounts allocated to target in Study 2a based on manipulated levels of target characteristics (collapsed across self and other targets).

<b>Study 2a Regression Model 1: Fixed Effects</b>					
	<i>Estimate</i>	<i>Std. Error</i>	<i>Df</i>	<i>t value</i>	<i>p value</i>
Intercept	2.914	.1648	291	17.682	<.001
Liking (mean-centered)	.010	.0037	1372	2.830	.005

Similarity (mean-centered)	.0086	.0033	1367	2.648	.008
Need (mean-centered)	.0152	.0024	1356	6.367	<.001
Deservingness (mean-centered)	.0314	.0036	1377	8.634	<.001
Target (0=other, 1=self)	.6533	.1574	1237	4.150	<.001

Table D.3: Fixed effects estimates from Study 2a model with no interaction effects.

<b>Study 2a Regression Model 1: Marginal R<sup>2</sup> values</b>			
<i>Effect</i>	<i>R<sup>2</sup></i>	<i>Upper CL</i>	<i>Lower CL</i>
Model	0.256	0.294	0.221
Deservingness	0.045	0.068	0.027
Need	0.024	0.042	0.011
Target	0.009	0.022	0.002
Liking	0.005	0.015	0.000
Similarity	0.004	0.014	0.000

Table D.4: Marginal R<sup>2</sup> values (effect size measures) for model and individual effects from Study 2a model with no interaction effects.

<b>Study 2a Regression Model 2: Fixed Effects</b>					
	<i>Estimate</i>	<i>Std. Error</i>	<i>Df</i>	<i>t value</i>	<i>p value</i>
Intercept	2.924	.1646	292	17.76	<.001
Liking (mean-centered)	.015	.0050	1328	3.0	.002
Similarity (mean-centered)	.0074	.0046	1338	1.609	.108
Need (mean-centered)	.011	.0033	1322	3.253	.001
Deservingness (mean-centered)	.0321	.0050	1337	6.442	<.001

Target (0=other, 1=self)	.6540	.1572	1233	4.159	<.001
Liking*Target	-.0010	.0070	1297	-1.434	.149
Similarity*Target	.0026	.0063	1319	0.415	.678
Need*Target	.0092	.0046	1294	1.986	.047
Deservingness*Target	-.0016	.0069	1291	-.224	.822

Table D.5: Fixed effects estimates from Study 2a model with interaction effects included.

<b>Study 2a Regression Model 2: Marginal R<sup>2</sup> values</b>			
<i>Effect</i>	<i>R<sup>2</sup></i>	<i>Upper CL</i>	<i>Lower CL</i>
Model	0.257	0.298	0.225
Deservingness	0.024	0.042	0.011
Target	0.009	0.022	0.002
Need	0.006	0.017	0.001
Liking	0.005	0.016	0.000
Need*Target	0.002	0.010	0.000
Similarity	0.002	0.009	0.000
Liking*Target	0.001	0.007	0.000
Similarity*Target	0.000	0.004	0.000
Deservingness*Target	0.000	0.004	0.000

Table D.6: Marginal R<sup>2</sup> values (effect size measures) for model and individual effects from Study 2a model with interaction effects included.

Study 2b: Incentive-compatible allocations

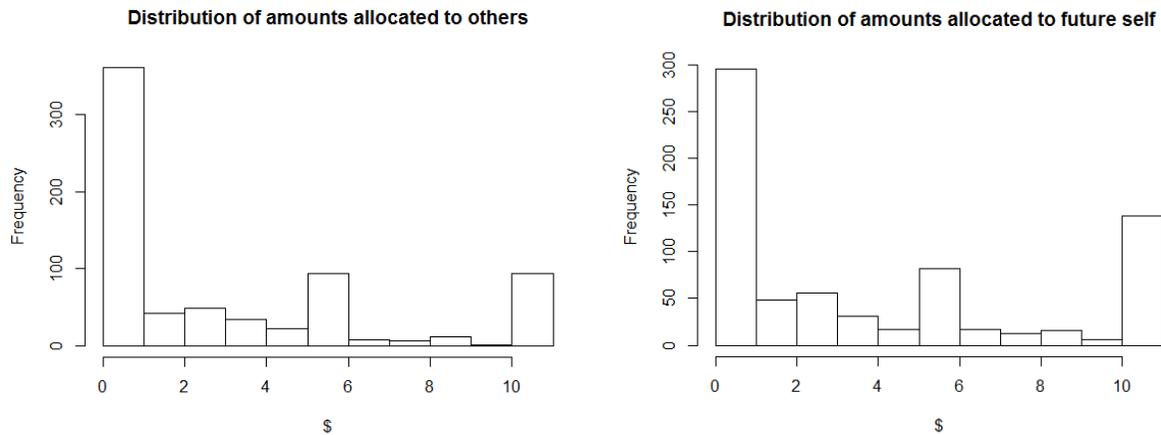


Figure D.2. Distribution of amounts allocated to others and future self in Study 2b.

Characteristic	Mean (SD) level of characteristic across high conditions	Mean (SD) allocation for high levels of characteristic	Mean (SD) level of characteristic across low conditions	Mean (SD) allocation for low levels of characteristic
Liking	82.28 (24.39)	4.472 (3.861)	28.07 (31.04)	1.615 (2.732)
Similarity	67.03 (30.94)	3.386 (3.646)	36.59 (32.67)	2.833 (3.744)
Need	77.33 (28.65)	4.065 (3.981)	26.33 (31.28)	2.185 (3.334)
Deservingness	76.58 (28.42)	4.602 (3.944)	26.75 (30.62)	1.312 (2.666)

Table D.7. Mean amounts allocated to target in Study 2b based on manipulated levels of target characteristics (collapses across self and other targets)

Study 2b Regression Model 1: Fixed Effects					
	<i>Estimate</i>	<i>Std. Error</i>	<i>Df</i>	<i>t value</i>	<i>p value</i>
Intercept	2.581	.1697	276	15.21	<.001

Liking (mean-centered)	.012	.0038	1375	3.128	.002
Similarity (mean-centered)	.0077	.0033	1365	2.306	.021
Need (mean-centered)	.011	.0023	1368	4.724	<.001
Deservingness (mean-centered)	.024	.0036	1369	6.829	<.001
Target (0=other, 1=self)	.958	.1527	1252	6.273	<.001

Table D.8: Fixed effects estimates from Study 2b model with no interaction effects.

<b>Study 2b Regression Model 1: Marginal R<sup>2</sup> values</b>			
<i>Effect</i>	<i>R<sup>2</sup></i>	<i>Upper CL</i>	<i>Lower CL</i>
Model	0.204	0.241	0.171
Deservingness	0.027	0.045	0.013
Target	0.020	0.036	0.008
Need	0.013	0.027	0.004
Liking	0.006	0.016	0.001
Similarity	0.003	0.011	0.000

Table D.9: Marginal R<sup>2</sup> values (effect size measures) for model and individual effects from Study 2b model with no interaction effects.

<b>Study 2b Regression Model 2: Fixed Effects</b>					
	<i>Estimate</i>	<i>Std. Error</i>	<i>Df</i>	<i>t value</i>	<i>p value</i>
Intercept	2.571	.1695	276	15.17	<.001
Liking (mean-centered)	.0172	.0056	1340	3.103	.002
Similarity (mean-centered)	.0031	.0049	1352	0.641	.521
Need (mean-centered)	.0121	.0032	1336	3.724	<.001

Deservingness (mean-centered)	.0270	.0051	1333	5.325	<.001
Target (0=other, 1=self)	.959	.1525	1248	6.288	<.001
Liking*Target	-.0099	.0073	1320	-1.359	.174
Similarity*Target	.0085	.0066	1341	1.275	.200
Need*Target	-.0016	.0045	1292	-0.361	.718
Deservingness*Target	-.0059	.0068	1295	-0.866	.386

Table D.10: Fixed effects estimates from Study 2b model with interaction effects included.

<b>Study 2b Regression Model 2: Marginal R<sup>2</sup> values</b>			
<i>Effect</i>	<i>R<sup>2</sup></i>	<i>Upper CL</i>	<i>Lower CL</i>
Model	0.207	0.246	0.176
Target	0.020	0.036	0.008
Deservingness	0.016	0.031	0.006
Need	0.008	0.019	0.001
Liking	0.005	0.016	0.000
Liking*Target	0.001	0.007	0.000
Similarity*Target	0.001	0.007	0.000
Deservingness*Target	0.000	0.005	0.000
Similarity	0.000	0.005	0.000
Need*Target	0.000	0.004	0.000

Table D.11: Marginal R<sup>2</sup> values (effect size measures) for model and individual effects from Study 2b model with interaction effects included.

**Appendix E: Full Results for Analysis by Assigned Condition (Study 2)**

<b>Model 1: Fixed Effects</b>					
	<i>Estimate</i>	<i>Std. Error</i>	<i>Df</i>	<i>t value</i>	<i>p value</i>
Intercept	2.793	.1181	563	23.661	<.001
Liking (-1=low, 0=not manipulated, 1=high)	1.387	.0757	2495	18.321	<.001
Similarity (-1=low, 0=not manipulated, 1=high)	0.341	.0794	2495	4.377	<.001
Need (-1=low, 0=not manipulated, 1=high)	0.924	.0760	2495	12.166	<.001
Deservingness (-1=low, 0=not manipulated, 1=high)	1.781	.0752	2495	23.702	<.001
Target (0=other, 1=self)	0.711	.1077	2495	6.597	<.001

Table E.1. Fixed effects using assigned conditions as predictors (no interaction effects).

<b>Marginal R<sup>2</sup> values</b>			
<i>Effect</i>	<i>R<sup>2</sup></i>	<i>Upper CL</i>	<i>Lower CL</i>
Model	0.223	0.249	0.199
Deservingness	0.127	0.150	0.106
Liking	0.080	0.100	0.062
Need	0.037	0.051	0.025
Target	0.011	0.020	0.005
Similarity	0.005	0.011	0.001

Table E.2: Marginal R<sup>2</sup> values (effect size measures) for model and individual effects from model with no interaction effects.

<b>Model 2: Fixed Effects</b>					
	<i>Estimate</i>	<i>Std. Error</i>	<i>Df</i>	<i>t value</i>	<i>p value</i>
Intercept	2.794	.1179	560	23.700	<.001
Liking (-1=low, 0=not manipulated, 1=high)	1.758	.1064	2491	16.525	<.001
Similarity (-1=low, 0=not manipulated, 1=high)	0.361	.1094	2491	3.297	<.001
Need (-1=low, 0=not manipulated, 1=high)	0.913	.1066	2491	8.565	<.001
Deservingness (-1=low, 0=not manipulated, 1=high)	2.061	.1054	2491	19.554	<.001
Target (0=other, 1=self)	0.710	.1070	2491	6.638	<.001
Liking*Target	-.7406	.1504	2491	-4.923	<.001
Similarity*Target	-.0399	.1548	2491	-0.258	.797
Need*Target	.0221	.1509	2491	0.147	.883
Deservingness*Target	-.5611	.1493	2491	-3.758	<.001

Table E.3. Fixed effects using assigned conditions as predictors, with interaction effects included.

<b>Regression Model 2: Marginal R<sup>2</sup> values</b>			
<i>Effect</i>	<i>R<sup>2</sup></i>	<i>Upper CL</i>	<i>Lower CL</i>
Model	0.230	0.258	0.207
Deservingness	0.090	0.110	0.071
Liking	0.066	0.084	0.049
Need	0.019	0.030	0.010
Target	0.011	0.020	0.005

Liking*Target	0.006	0.013	0.002
Deservingness*Target	0.004	0.009	0.001
Similarity	0.003	0.008	0.000
Similarity*Target	0.000	0.002	0.000
Need*Target	0.000	0.002	0.000

Table E.4: Marginal  $R^2$  values (effect size measures) for model and individual effects from model with interaction effects included.