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

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ABSTRACT

People often make decisions that involve tradeoffs between current and future benefits, such as deciding whether to buy a new gadget or save for retirement, whether to choose an indulgent or a healthy snack, or whether to watch another episode of a favorite TV show or go to bed and get some rest. When discussing these types of decisions, the analogy is often made that people *treat the future self as if it were another person*; implying that they subordinate the needs of the future self to their current needs and desires in the same manner that they subordinate the needs of others. Although it has been demonstrated that people make similar choices for future selves and others in some contexts, it remains unclear whether these behaviors are governed by the same decision processes. The current paper explores whether the future self is in fact treated like another person by directly comparing the influence of four relevant characteristics (need, deservingness, liking, and similarity) on monetary decisions involving another person or the future self. The influence of these characteristics on allocations was found to be similar for both types of targets. Nevertheless, monetary allocations to the future self were higher than allocations to others even when controlling for levels of the four characteristics. This suggests that though the future self is treated like others in some ways, important differences remain that are not fully captured by this analogy.

INTRODUCTION

Imagine that you received a lottery ticket for your birthday from a well-meaning friend (who does not study probability or decision-making for a living). Despite the odds being stacked against you (e.g., at the time of this writing, there is a 1 in 292,201,338 chance of winning the Illinois Powerball Jackpot), you win big! After getting over the initial shock, you begin pondering how you will use the money, and wonder whether you will give any of it away. What factors will influence who you decide to give to and how much to allocate to them? Furthermore, when it comes to the money you decide to keep for yourself, how much of it will you spend now on a new wardrobe and new yacht, and how much will you save? This latter decision can be considered another type of allocation decision – but an *intra*personal allocation between your current self and future self rather than an *inter*personal allocation between yourself and another party. How do we make both of these types of decisions? Specifically, do intrapersonal and interpersonal allocation decisions rely on the same determining factors, or do people approach them in completely different ways?

Several researchers have suggested that we treat the future self like another person, given that people often prioritize current needs over future ones much as they prioritize their own needs over those of others (e.g., Bartels & Rips, 2010; Bartels & Urminsky, 2011; Burum, Gilbert, & Wilson, 2016; Ersner-Hershfield, Wimmer, & Knutson, 2009; Hershfield, 2011; Pronin, Olivola, & Kennedy, 2008; Pronin & Ross, 2006). For example, participants who were asked to make decisions about a disgusting-tasting beverage as part of an experiment chose relatively little for themselves to drink immediately, but assigned greater amounts for themselves to drink in the future or for another student to drink now (Pronin et al., 2008). Thus, we find that

at least in some contexts, people make similar choices for the future self and a current other, but privilege the needs of the current self over both the future self and others.

It is possible that parallel behaviors towards future selves and others may be driven by similar mental processes. The discounting of one's own future needs and the needs of others both increase hyperbolically in response to temporal and social distance respectively (Garon, Johnson, & Steeves, 2011; Jones & Rachlin, 2006; 2009; Rachlin & Jones, 2008). These two types of discounting also tend to be correlated with each other across individuals (Jones & Rachlin, 2009), suggesting that they may be manifestations of a single underlying system of reward valuation. It is possible that decreased valuation of needs with both social distance and time is driven by a reduced ability and/or desire to attend to the subjective experience of more distant targets (Loewenstein, 1996; Pronin et al., 2008).

However, in addition to findings focusing on similarities between the way people treat other people and the way they treat their own future self, there is also a large body of research documenting fundamental differences in how people think about the self and others more generally (Molouki & Pronin, 2015). When people make judgments about the self, they are more likely to use information derived from internal states such as thoughts, motives, and feelings, but when judging others, will place more weight on external behaviors and characteristics (Pronin, 2009). This tendency can then lead to wide variety of self-other asymmetries, including the perception that one is more skilled or has better character than others (Kruger, 1999; Kruger & Dunning, 1999; Kruger & Gilovich, 2004), is more resistant to social influence (Pronin, Berger, & Molouki, 2007), or is less biased than others (Pronin, Lin, & Ross, 2002). Notably, these self-other asymmetries can extend to the future self in certain situations (Pronin & Ross, 2006), and it has been shown that people incorporate future-oriented information (e.g., about intentions or

potential) into their overall self-concept and self-judgments (Williams & Gilovich, 2008; Williams, Gilovich, & Dunning, 2012). Given these asymmetries in perceptions and judgment of self and others (many of which paint the self in a more positive light than others), it is possible that some of these asymmetries might also extend to create differences in how people choose to treat the future self compared to how they treat others.

Though previous research highlights both similarities and differences in how people treat the future self and others, it does not directly answer the question of whether people use the same or different criteria to evaluate these targets. It is worth noting that most studies presenting participants with tradeoffs between the current self, future self, and/or another person have not manipulated or assessed specific personal characteristics of these targets. Therefore, it is possible that findings may be sensitive to variations in unmeasured personal characteristics of the reward recipient. Indeed, Burum et al. (2016) demonstrated that people allocated similar amounts of an unpleasant task to their future self and to a stranger when they were informed that the future self would become a member of an outgroup. However, of note, allocation of negative experiences to the future self were significantly lower than to the stranger when they were told that the future self would remain an ingroup member. This supports the possibility that contextually-dependent characteristics of the targets matter in making such decisions, and that these factors should be taken into account when making comparisons between the future self and others.

Thus, the present work explores the analogy between future selves and others by explicitly examining how personal attributes of other people and the future self affect decisions about monetary allocations. It remains an empirical question whether people in fact weight characteristics of the future self and other people in the same way when deciding how to distribute benefits or harms to these targets. By identifying similarities and differences in the

determinants of intrapersonal and interpersonal allocations, the present experiments aim to answer this question. In doing so, we can gain insight into which strategies might be most effective in shaping people's decisions so as to maximize their overall wellbeing.

Background: Interpersonal and Intrapersonal Allocations

Determinants of allocation decisions between self and others have been widely examined in the psychological and behavioral economics literature. A now ubiquitous allocation paradigm, the dictator game, was originally developed to study third party punishment (Kahneman, Knetsch, & Thaler, 1986). The paradigm was later simplified further to remove the punishment component (Forsythe, Horowitz, Savin, & Sefton, 1994). In its basic form, a participant playing the role of "dictator" makes one decision about how much of a fixed amount of money to give to a single other recipient, while keeping the rest. The recipient must accept the offer as stated (anything from 0-100% of the amount endowed to the dictator may be offered, though usually only in whole number increments). A majority (~64%, see Engel, 2011 for meta-analytic findings) of dictators in fact choose to give a non-zero amount to a third party even in anonymous situations, challenging the economic assumption of pure self-interested utility maximization.

Since this initial finding, researchers have systematically varied the context of the task to identify which factors (including characteristics of the giver, potential recipient, and situation) tend to reliably alter the amount given. Characteristics of the recipient (which are of most interest for the current project) that have a significant impact on distributions include: need and deservingness (Fong, 2007; Fong & Oberholzer-Gee, 2011), whether the recipient earned any of the endowment (Oxoby & Spraggon, 2008), and closeness to the giver (e.g., Branas-Garza et al., 2010; Goeree, McConnell, Mitchell, Tromp, & Yariv, 2010; Leider, Mobius, Rosenblat, & Do,

2009). To tie this back to our opening lottery example: taking into mind the need of the recipients, you might be more likely to give money to a charity than a well-off recipient. You might also feel that you should give some money to the friend who bought you the lottery ticket, who you think earned or deserves some of the money by choosing the winning numbers. Finally, social distance considerations mean that holding everything else equal, you would probably prefer to give money to your closest family and friends, rather than to a casual acquaintance or stranger.

Whereas research on interpersonal allocation has highlighted recipient characteristics of need, deservingness, and social distance (Engel, 2011), research on intrapersonal allocation has thus far mainly focused on perceived similarity between the current and future self. One reason for this may be because perceived similarity can increase both the vividness and valuation of future needs. Whereas current needs are often viscerally evocative, the needs of a future self are perceived in a more distant, abstract, and unemotional manner (Loewenstein, 1996; Metcalfe & Mischel, 1999; O'Brien, 2015; Sayette, Loewenstein, & Griffin, 2008). As a consequence, attention is naturally drawn to the desires of the "current self," which are more mentally accessible and vivid than long-term needs (Hershfield, 2011). Even in cases where long-term consequences of decisions are brought to mind, these may be dismissed if one does not care enough about the needs of the future self. In other words, even if people are aware that their current actions will lead to negative future outcomes, they may still engage in these actions if they do not value the well-being of the future self enough to make a current sacrifice (Bartels & Urminsky, 2015).

Perceived similarity of the future self can mitigate the chasm between current and future needs by reducing obstacles related to both attention and valuation. The needs of a similar future

self will likely be understood with reference to those of the current self. The accompanying ease of imaginability of and identification with these future needs will draw attention towards future consequences (Hershfield, 2011). Increased emotional identification with a similar future self will also in turn increase one's valuation of benefits accruing to this recipient (Bartels & Urminsky, 2011; 2015). In line with this reasoning, manipulations that increase perceived similarity between the current and future self have been shown to increase behaviors with long-term benefits, such as saving money, delaying purchases, or keeping New Year's resolutions (Bartels & Urminsky, 2011, 2015; Hershfield, 2011).

Because research on interpersonal and intrapersonal allocations has thus far remained mostly separate, a central question is whether factors thought to increase valuation of the needs of a future self are the same as or different from the factors that encourage valuation of the needs of others. The current project will systematically investigate the extent to which intrapersonal and interpersonal resource allocations are influenced by a common set of target-related factors. In doing so, we hope to gain a better understanding of decisions affecting the future self by delineating whether, and when, these can be likened to decisions affecting others.

Previous Research on Determinants of Allocations to the Future Self

Psychological Connectedness

Experimental work on how people's conception of their own future self affects their decisions has been heavily influenced by the writings of philosopher Derek Parfit. Parfit (1971, 1984) adopted the view that concern about the fate of the future self should be determined by the expected continuity of one's psychological characteristics over time, or, in other words, the degree of psychological connectedness between the current and future self. According to Parfit

(1984), a person's identity is entirely made up of the existence of and interrelationships between important psychological characteristics (such as personality, experiences, values, preferences, beliefs, and memories). Thus, only those who expect these characteristics to remain largely stable over time will retain a continuous identity, and in turn, only these individuals should retain a specific interest in securing their future well-being.[1] In contrast, if a person expects a lot of change in her important psychological characteristics, this would weaken the degree of continuity between who she is now and who she will become. In this latter case, the individual has less basis upon which to specifically care about the welfare of her future self. In the extreme case (i.e., zero psychological overlap) one would have no reason to feel any special concern for the future self above and beyond the concern that would be extended to a third party with the same characteristics.

Parfit's (1971, 1984) arguments were and presented as a counterpoint to the theory of rational egoism, otherwise known as self-interest theory. Self-interest theory defines a rational action as one which maximizes value to the agent making the decision. Although self-interest theory privileges one agent (the self) over others (anyone else), it is temporally neutral: it holds that one should strive to maximize one's own total lifetime welfare. Thus, under this theory, our primary concern should be to make choices that maximize our own needs at all points in time rather than paying any special attention to the current moment. However, this theory presumes that there is in fact a unifying concept of the "self" that persists over time to distinguish us from others - which is the idea that Parfit challenged. What precisely defines the self? Is it simply the organism that is co-located with a specific body? Is it defined by the preservation of specific

[1] Similar views had also been expressed previously by Hume (1751), Sidgwick (1874), Strotz (1956), Lewis (1983), and others, however Parfit is well known for consolidating, expanding upon, and specifically endorsing the view that there is no special ingredient defining personal identity beyond a set of overlapping characteristics over time.

mental characteristics (such as memories or beliefs)? Is it maintained via something even less tangible, like the presence of a soul?

Although various thinkers have argued for each of these possibilities (see Martin & Barresi, 2002), Parfit (1984) maintains that there is no underlying concept of personal identity distinct from one's specific psychological experiences and the connections between them. In his view, a person's temporal persistence is defined by these connections (e.g., the connection between intention and corresponding action, or between a belief at Time 1 and the continuation of this belief at Time 2). Notably, continuity over time is a matter of degree: a person's characteristics can remain completely the same (maximum preservation of continuity), some characteristics may change while others may remain the same (moderate continuity), or they may all change completely (maximum loss of continuity).

Parfit reasons from this analysis that an individual would have little justification to feel concern for a "future self" in cases where large changes over time will weaken the connections between psychological characteristics held in the present and the future. Because there exists no concept of "self" independent of these possibly tenuous connections, there is no inherently stable distinction between self and others that would justify a temporally neutral self-interest theory. As a result, Parfit concludes that the only logical way to be agent-specific is to also be temporally-specific. In a world where the delineation of the "self" can weaken over time, being agent-specific (favoring the self over others) also requires being temporally-specific, since the current self is the only "self" which can be defined with certainty. This provides a rationale for privileging the needs of the present self over those of other individuals who are less psychologically connected with us, whether these be future selves or third parties.

Empirical Research on Psychological Connectedness and Intertemporal Choice

Although Parfit's arguments were purely normative, a body of research has emerged examining whether people seem to act descriptively in accordance with these ideas. For example, it is thought that psychological connectedness could play an explanatory role in the phenomenon of temporal discounting, which is the widely observed tendency to assign lower subjective value to rewards as the time delay to receipt increases. Might people discount their own long-term benefits because they feel less psychologically connected to versions of themselves that recede farther into the future?

There are many possible reasons to discount future gains. For example, the subjective value of delayed outcomes is partially reduced in response to lower expected utility attributable to interest rates or uncertainty (Frederick, Loewenstein, & O'Donoghue, 2002). But, an abundance of empirical data has revealed both a high overall magnitude of average discount rates and systematically observed patterns of temporal inconsistency that seem to suggest additional factors may be at play. For example, patterns of discounting follow a hyperbolic pattern: a delay originating in the present moment (e.g., today vs. one month from now) is discounted more steeply than a delay of equivalent length at a future time (e.g., one month vs two months; Frederick et al., 2002; Urminsky & Zauberman, 2016). Both the extremity and inconsistency in discount rates suggest that there is an additional time preference for sooner outcomes that exists over and above reasonable adjustments for changes in expected utility due to external factors (Frederick et al., 2002).

Thus, beginning with Frederick (2003), empirical research has drawn upon Parfit's (1984) ideas to explore whether variations in psychological connectedness could be one explanation for observed time preferences in the discounting domain. In his original study, Frederick did not find a significant correlation between participants' self-reported connectedness

to the future self and behavior on a temporal discounting task. However, he established an operationalization of Parfit's "psychological connectedness" as a person's perceived similarity between their current and future self, with regards to important psychological characteristics including "personality, temperament, likes and dislikes, beliefs, values, ambitions, goals, and ideals."[2] Several empirical studies have since found that psychological connectedness with (that is, perceived similarity to) the future self is in fact associated with reduced discounting of future outcomes and greater future-oriented behavior in a laboratory setting (Bartels & Rips, 2010; Ersner-Hershfield, Garton, Ballard, Samanez-Larkin, & Knutson, 2009).[3] Perceived connectedness to the future self has also been correlated with real-world behaviors thought to reflect concern for future consequences, such as asset accumulation (Ersner-Hershfield, Garton, et al., 2009) and academic performance (Adelman et al., 2017).

Conversely, low psychological connectedness to the future self has been associated with a greater focus on immediate rewards at the expense of long-term consequences. For example, Hershfield, Cohen, and Thompson (2012) found that low connectedness was associated with a greater propensity to tolerate and engage in unethical behavior for immediate gain. And, larger discrepancies in brain activation patterns when thinking about the current versus future self (suggesting perceived dissimilarity between these stimuli) have been associated with higher discounting of future rewards and reduced concern for future needs (Ersner-Hershfield, Wimmer,

[2] More recent research has also stressed the fact that it is specifically the continuity of personal characteristics central to a person's self-concept that define connectedness, rather than changes in features considered to be peripheral (Chen, Urminsky, & Bartels, 2016; Molouki & Bartels, 2017; Strohminger & Nichols, 2014).
[3] Note that many of the empirical studies discussed refer to the similarity measures as "self-continuity" measures. Parfit (1984), however, distinguished between the concept of connectedness (which refers to the relation between two versions of the self at two specific points in time) and continuity (which refers to the existence of a transitive chain of connectedness linking versions of the self at multiple points in time). Because all the empirical studies discussed only measure similarity between the self now and the self at a single future time point, I will use the terms connectedness or similarity (rather than continuity) to avoid confusion when describing these studies.

& Knutson, 2009). This result parallels findings in an interpersonal context whereby reduced helping behavior has been associated with larger discrepancies in brain activation in response to one's own versus another's suffering (Hein, Silani, Preuschoff, Batson, & Singer, 2010).

In addition to the correlational findings described above, several studies have directly manipulated perceived similarity between the current and future self, suggesting a causal link between psychological connectedness and future concern. In one study (Bartels & Urminsky, 2011), college students were led to believe that they would undergo large changes in their personalities, preferences, and values after graduation, creating a perception of little overlap between the present and future self. Participants in that condition were more likely to choose the chance to receive a lower-value gift card immediately, rather than a higher-value one after some delay. In contrast, those who were led to expect that their psychological characteristics would remain stable after graduation were more willing to wait for the higher value reward. In some cases, people made to feel disconnected from the future self would even prefer to give their money away to others (donating to a charity) rather than endowing it to a future self (Bartels, Kvaran, & Nichols, 2013). A feeling of psychological disconnectedness can even extend to objects associated with the future self: in one study, a product owned by the future self was rated less favorably when a life-changing event was described as occurring *before* (but not after) the product was acquired (Zhang & Aggarwal, 2015).

Positive and Negative Future Selves

The body of empirical work described above suggests that Parfit's thoughts about connectedness to the future seems to have some descriptive validity. The more people expect

important parts of themselves to change over time, the more they report feeling psychologically dissimilar to their future self, and the more they choose to act in ways that prioritize current needs over future benefits. However, in addition to effects of the magnitude of personal change, Parfit (1984) suggests that "the value to me of my relation to a [future self] depends…on the value…of this person's physical and psychological features" (p. 299). This suggests that positive qualities of the future self may influence our level of concern for this individual independently of the degree of overlap with our current self. Parfit goes on to state that even if we expect relatively large changes in the future, "if the changes were improvements, we would welcome the partial reduction of…connectedness" (p. 299). In other words, observed lack of concern for the future self after significant personal change may, in at least some cases, be related to a devaluing of the resultant characteristics of the changed individual rather than the reduction in similarity per se. Brink (1997) further claims that a purely similarity-driven view of future concern is illogical, since if this were the case, people would never strive to attain large self-improvements. He suggests that if stability happens to be commonly associated with future profiles that are liked or valued, similarity may "gain specious plausibility" as a driver of future concern when the true driver is in fact positive regard.

Despite these ideas, valence of change has been less studied than similarity in experimental work on intrapersonal decision-making. Although Bartels and Urminsky (2011) verified that the effects of psychological connectedness on discounting were not driven by differences in liking of the future self, most previous work has not directly manipulated or examined valence of change. However, in one series of studies, change to psychological characteristics described as either negative (i.e., "worsening") or unspecified (i.e., "change") did in fact reduce people's identification with a future self more than change described in a positive

way (i.e., “improvement”; Molouki & Bartels, 2017). Furthermore, imagining negative, but not positive, personal changes has been found to reduce people’s stated willingness to make a current tradeoff to benefit the future self (Molouki, Bartels, & Hershfield, 2015).

Summary

As discussed in the above review of both philosophical and empirical work, there is evidence to suggest that level of concern for and allocation to the future self is affected by at least two factors: perceived similarity between the current and future self and degree of liking of the future self. The factors of liking and similarity have also been discussed in the literature on perceptions of others as possible determinants of social closeness, which is thought to contribute to interpersonal helping behavior, as further discussed in the next section. However, the effect of these constructs on allocation to others and allocations to the future self has rarely been examined within the same research paradigm. Thus, it remains to be seen whether these attributes affect behavior towards interpersonal and intrapersonal targets to a similar degree and in the same way.

Previous Research on Determinants of Allocations to Others

Social Distance: Liking and Similarity

The literature on interpersonal allocation broadly identifies social distance as a determinant of giving to others. In general, social distance seems to be determined mainly via social role (i.e., status as friend or family member) rather than specific personal characteristics of the potential recipient. For example, Goeree et al. (2010) defined social distance among a sample of school children as the number of links separating two individuals in a social network (i.e., individuals directly identified as friends are closer than friends of friends, etc.). This work found

that though the structure of the social network itself was affected by personal attributes (with links being more likely between more similar individuals), the amount given in a dictator game was only directly affected by distance in the network, without any additional effect of recipient characteristics. Similarly, Leider et al. (2009) found a 52 percent increase in giving to friends over strangers. Jones & Rachlin (2006; 2009; Rachlin & Jones, 2008) found that self-defined social closeness was associated with increased allocations even when the particular form of the relationships was not dictated (i.e., in these studies, participants were asked to create their own list of (any) individuals based on self-perceived closeness). Bohnet and Frey (1999) demonstrated that social distance can be varied even among a group of targets with whom participant had minimal pre-existing relationships. In this experiment, behavior was affected by identifiability (i.e., whether the identity of the potential recipient in a classroom of students was known or anonymous), with participants more likely to give to targets who were known to them.

Although social closeness has been represented in various ways, we note that concepts that are defined directly via relational terms (such as friendship or ingroup/outgroup status) cannot be as easily manipulated in an intrapersonal context. However, in addition to being based on inherently relational factors such as interdependence (e.g., Flippen, Hornstein, Siegal, & Weitzmann, 1996), relationships such as friendship also rely on elements like liking and similarity that can be manipulated by varying characteristics of the potential recipient (Hogg & Turner, 1985; Jones & Rachlin, 2006; Kruglanski, Shah, Pierro, & Mannett, 2002; Rothgerber, 1997; Wilder, 1984). For example, our social networks tend to be comprised of similar others on various target-specific dimensions, including demographic characteristics, behavior, and attitudes (Goeree et al., 2010; McPherson, Smith-Lovin, & Cook, 2001). This is partially due to structural reasons: relationships are formed and maintained with those who (a) are

geographically close to us, and (b) are members of the same social groups, meaning that they are exposed to the same environmental and social influences (McPherson et al., 2001). Other reasons for maintaining relationships with similar others are related to more direct cognitive and relational factors: when others share our attitudes, it is socially reinforcing (Byrne & Clore, 1967) and leads to more smooth coordination of interactions due to shared knowledge and tastes (Mayhew, McPherson, Rotolo, & Smith-Lovin, 1995). Thus, manipulating perceived similarity of a target can potentially capture many elements of social relationships that may be influential for allocation decisions.

Research also suggests that liking seems to be associated with both similarity and social closeness. Perceived similarity can increase our sense of liking of both unknown others (Byrne, 1961; Byrne & Nelson, 1965) as well as partners in established relationships (Amodio & Showers, 2005). Conversely, people may also assume (sometimes incorrectly) that those they like are similar to them (Byrne, 1997; Jussim & Osgood, 1989; Sprecher, 2014). Because liking and perceived similarity to the self are attitudes that can be directed at any target, they can more easily be examined for both the future self and a third party (in contrast to measures of social distance defined directly via specific relational connections or ingroup/outgroup status). Thus, the current set of studies will use assessments of liking and similarity, rather than specific relationship types, to represent determinants of closeness for both intrapersonal and interpersonal relationships. Of note, however, it is possible that specific types of well-defined relationships, (such as family relations), may be associated with feelings of obligation or responsibility that can affect allocation decisions independently of either liking or similarity (Bryan & Hershfield, 2012; Whiting, 1986). Though these potential feelings of obligation are not directly manipulated

or assessed in the current studies, we note that this concept will be revisited in the General Discussion.

Need and Deservingness

Existing research on interpersonal allocations suggests that people may follow a social welfare model when deciding how to distribute goods. Under this model, people aim to maximize the aggregate of total payoffs to all parties, but with special emphasis on those who are worse off. Thus, people place more weight on the outcome of a potential recipient when this person currently has less of the good in question, and are more likely to give to others who are needier than themselves (Charness & Rabin, 2002). Other work confirms that people will allocate more to others when the potential recipient has a specific need for that particular resource (Aguiar, Branas-Garza, & Miller, 2008; Eckel & Grossman, 1996; Konow, 2010), though this tendency will be diminished if the others' desire is perceived to be a product of tastes or beliefs rather than a true lack of resources (Yaari & Bar-Hillel, 1984).

Another attribute that is separable from need is the degree to which the target is believed to deserve, or be worthy of, the allocation. For example, Fong and colleagues (Fong, 2007; Fong & Luttmer, 2011; Fong & Oberholzer-Gee, 2011) found higher rates of giving to targets who were described as industrious or interested in working, even when all targets in the pool of potential recipients were known to be needy (i.e., welfare recipients). This finding is thought to be due to reciprocity and fairness concerns: people are less likely to reward those who are perceived as responsible for their own predicament and/or intentionally taking advantage of the generosity of others (Charness & Rabin, 2002; Fong, Bowles, & Gintis, 2006). Evaluations of deservingness are closely tied to the perceived moral character of the recipient: laziness and

dishonesty are particularly damaging to evaluations of deservingness because they are viewed as specifically moral failings (e.g., Lapsley & Lasky, 2001).

In addition to having a moral component, deservingness may also be determined based on individual production or achievement (Cappelen, Hole, Sorensen, & Tungodden, 2007; Frohlich, Oppenheimer, & Kurki, 2004; Gachter & Riedl, 2006; Klein & O'Brien, 2016; Oxoby & Spraggon, 2008). Meta-analysis indicates that overall, allocators in a dictator game are significantly more likely to give to recipients who have demonstrated that they have earned a share of the money via previous task performance (Engel, 2011). Nevertheless, even the demonstration of having earned money is open to interpretation: in one study, allocators judged recipients who competed in a skill-testing contest as worthy of reward based not only on demonstrated skills, but sometimes also on effort (Ruffle, 1998).

Furthermore, Cappelen, Moene, Sorensen, & Tungodden (2013) examined the joint effect of need and deservingness by independently varying both of these factors. Potential recipients in their study either lived in high-income or low-income countries and their previous performance on a previous typing task had been assigned either a high or low monetary value. In this study, both need and performance influenced the allocators' payment. In general, allocators increased the amount given based on task performance, but also adjusted this amount based on overall need, giving low-income recipients more than they had earned and high-income recipients less than they had earned. This finding suggests that need and deservingness can be conceptualized as independent and additive factors contributing to decisions about allocating to others.

Current Studies

The primary goal of the current research is to quantify whether target-specific characteristics thought to impact allocation decisions based on previous research (i.e., liking, similarity, deservingness, need) are equivalently weighted when considering decisions affecting the future self versus decisions affecting others. Monetary allocation is examined because it provides an easily quantifiable test of benefits bestowed upon others and future selves. This is also a practically relevant domain that has garnered interest in contexts such as understanding and encouraging charitable contributions (i.e., allocations to others; Dickert, Sagara, & Slovic, 2011; Lee & Chang, 2007; Mayo & Tinsley, 2009; Zarghamee et al., 2017) or savings and retirement planning (i.e., allocations to future selves; Ersner-Hershfield, Garton, et al., 2009; Koehler, Langstaff, & Liu, 2015).

If intrapersonal allocations are indeed responsive to the same target characteristics that affect interpersonal allocations, this might suggest that people employ similar decision processes when making tradeoffs between current personal benefits (e.g., keeping a sum of money) and distant benefits (either temporally distant, such as saving for the future self, or socially distant, such as giving to another person). In this case, efforts to shape intrapersonal decisions can build off of elements already highlighted in the literature on interpersonal allocation. On the other hand, if people do not rely on target characteristics in the same way when making decisions affecting the future self as they do for another person, this suggests that intrapersonal allocations may operate via a different decision process. In this case, novel ideas and theories would need to be specifically tested in an intrapersonal context, rather than treating the future self as "just another person." If intrapersonal allocations are indeed found to be significantly different, the analyses in the current work could provide guidance with regards to how these decisions can be uniquely targeted.

In order to properly compare how different target characteristics are weighted in allocations for the future self and another person, the first set of studies in this paper (1a-1f) empirically verifies the characteristics of interest and evaluates them for relevance and completeness. Identifying and covering the full set of factors that people consider in these decisions is important, since performing analyses with an incomplete set would lead to inaccurate weightings. In Studies 1a-1b, participants generated personal characteristics that they would be most likely to rely on when making a decision to allocate money to others or the future self. To confirm that people would in fact rely on the general characteristics generated in Studies 1a-1b, we asked participants in Studies 1c-1f to create and evaluate the relevance of specific questions that could be used to elicit information about these characteristics or otherwise inform a decision about monetary allocation.

Study 2 used a question selection procedure as a first measure of whether people consider different input factors in evaluating other people versus future selves. Participants selected and ranked representative questions from the first set of studies based on perceived usefulness in making allocation decisions for either an interpersonal or intrapersonal target. Study 3 then confirmed that people can generate a list of targets comprised of both other people and imagined versions of the future self that vary meaningfully on the identified dimensions of interest. Study 4 developed and tested manipulations to vary the focal characteristics in a consistent fashion for both future selves and others, such that their influence could be properly compared across these targets.

The main test of whether future selves are truly treated as others is in Study 5, where we assessed the relative impact of the focal characteristics (liking, similarity, need, deservingness) on an allocation decision. We systematically varied the levels of these four characteristics in the

target recipients, and then measured their relative influence on monetary allocations for both types of target (future self or other). The steps in Studies 3 and 4 are crucial for the successful interpretation of Study 5 results. For example, if certain factors were always highly correlated with each other within our targets (e.g., similarity and liking) we would be unable to assess their independent effects on allocation decisions. Alternatively, if a certain quality were highly correlated with the type of target (e.g., if the future self is always highly liked regardless of manipulated condition), this would also create a confound. Overall, Studies 3 and 4 confirmed that there were not likely to be major confounding issues related to these factors, thus we believe that Study 5 provides an accurate view of the way people weight of these characteristics in allocation decisions.

STUDIES 1a-1f: GENERATION AND EVALUATION OF RELEVANT TARGET CHARACTERISTICS

Study 1a: Generating Relevant Characteristics of Others

Factors of interest for the current studies were initially identified from literature on intrapersonal and interpersonal allocations. Work on intrapersonal allocation highlights perceived similarity between the current and future self as an important factor (e.g., Bartels & Urminsky, 2011; Frederick, 2003; Hershfield, 2011), whereas work on allocations to others highlights (a) social distance between the giver and recipient, (b) recipient's claim to or deservingness of the share, and (c) recipient need (e.g., Bohnet & Frey, 1999; Cappelen, et al., 2013; Charness & Rabin, 2002; Engel, 2011; Fong, 2007; Goeree et al., 2010; Jones & Rachlin, 2006; Yaari & Bar-Hillel, 1984).

In order to verify the selection of these factors of interest as well as to possibly identify additional factors that people consider in allocation decisions, sixteen students in a campus lab participated in an initial free response study. They were instructed to respond out loud to a prompt read by the experimenter asking what information they would like to know about someone before deciding whether to give money to that person (see Appendix A for full text of this prompt). Answers were audio recorded and later classified based on the types of factors mentioned.

Results

Fifteen out of the sixteen participants mentioned wanting to know about the target's need for the money, and two mentioned that they would consider their own need for the money before making an allocation decision. Thus, need is likely an important factor in decisions to give to others. Additionally, seven participants described elements related to the target's deservingness. These participants either suggested that they would assess whether they approved of the use of the money (e.g., "if the money was being put towards good deeds," "if I deemed whatever they planned to do with it worthy,") or described evidence related to whether the target was requesting the money in good faith (e.g., "what other avenues they have tried," "whether they are trustworthy and a nice honest person in general"). Both of these types of explanations draw upon the moral component of deservingness judgments by highlighting the uses of the money (e.g., to ensure that the desire is well-intentioned) and ensuring that the requestor is not trying to take advantage of the generosity. Five participants mentioned the target person's closeness or relationship to them, suggesting that they would be more likely to give to a friend or family member versus a stranger. This confirms that social distance is considered by people in their allocation decisions, which may in turn incorporate assessments of similarity and/or liking. In

addition, four participants mentioned wanting to broadly know about the recipient's personality, which could be related to one or more of the judgments of liking, similarity, or deservingness.

Study 1b: Generating Relevant Characteristics of the Future Self

Study 1b replicates the general design of Study 1a, however instead of using a third party, it asks participants what aspects of the future self they would consider when making an intrapersonal allocation between the current self and the future self in one year (see Appendix A for text of prompt). This ensures that any factors that may be considered uniquely within the domain of intrapersonal allocations are not inadvertently omitted from our analyses.

Results

In the case of allocations to the future self, need was again mentioned in the majority of responses (12 out of 15 participants mentioned need of the future and/or current self). In addition, one participant spontaneously mentioned similarity between the current and the future self, stating "I'm assuming he'd be pretty much the same as my current self, maybe just at a different level of financial security…" Finally, three participants gave answers that included judgments relevant to deservingness, appealing either to moral qualities of the future self or to the use of the money. For example, one participant stated, "I would like to know how strong I'm going to be mentally, how much self-discipline I have gained" and another said "doing the right thing [with the money] is what is the object."

Studies 1a and 1b confirm that qualities of targets mentioned in the previous literature indeed seem to be those that are generated by participants when considering interpersonal or intrapersonal allocations. In a free-response session where they were allowed to name any type of information about the target that they saw as relevant to an allocation decision, participants

generally provided responses related to need, deservingness, liking, similarity, or closely related concepts. The fact that these characteristics were brought forth when using an open-ended format without prior cueing suggests that these factors are likely to be spontaneously considered in real-life allocation decisions.

Nonetheless, our certainty that all factors relevant to an allocation decision were captured is limited by the small number of participants, the speak aloud response format (which may have raised self-presentational concerns), and the fact that responses were categorized by a researcher not blind to the overall nature of the study. To minimize the impact of these possibilities, Studies 1c and 1e used an online format in which participants generated and typed in specific questions they would ask to assess another person's characteristics. These questions were then evaluated and categorized by separate samples of online participants (who were completely unaware of the study hypotheses) in Studies 1d and 1f. This design allows us to capture and categorize any additional factors that people are interested in assessing before an allocation decision that may have not been identified in Studies 1a and 1b. Another goal of Study 1c was to create specific questions related to liking, similarity, need, and deservingness to be used in Study 2 for assessing participant-perceived importance of these characteristics for interpersonal and intrapersonal allocations.

Study 1c: Generation of Questions to Assess Others

In this Study, 101 participants from Amazon Mechanical Turk were randomly assigned to one of five conditions in which they were asked to generate the top three questions they would ask to assess a particular aspect of a person they had never met. Depending on condition, they were instructed to evaluate one of the following: 1) "the extent to which someone you have never met before is in need of money," 2) "the extent to which someone you have never met before

deserves to receive money," 3) "the extent to which you would like someone you have never met before," 4) "the extent to which someone you have never met before is similar to you," or 5) "whether and how much [money] you would give to someone you have never met before." The last category was included in order to generate questions relevant to allocation decisions that may not fall into any of the other four categories. The 303 questions generated were edited for duplicate content and condensed into a set of 140 distinct questions that were presented to a separate sample of participants in Study 1d.

Study 1d: Categorization of Questions to Assess Others

A separate sample of 71 participants from Amazon Mechanical Turk was presented with the 140 questions gathered from Study 1c and asked to classify each question into one of five different categories based on what type of information they thought this question would provide when asked of a stranger. The categories provided were 1) "How much this person is in need of money," 2) "How much this person deserves to receive money," 3) "How much you would like this person," 4) "How similar this person is to you," and 5) "Other." Participants were told that if they believed the question would provide information about multiple categories, they should choose the best-fitting one, and should only choose "Other" if the question would not provide information about any of the listed categories.

Results

Out of the 140 questions used, only two questions were more frequently categorized as "Other" than into any of the other 4 categories. These questions were "Where did people come from?" (47.9% categorized as "other") and "What do you look like?" (40.8% categorized as "other"). Notably, both of these questions originated from participants who were asked to

generate questions assessing liking in Study 1c, not from those who were asked to generate questions they would ask prior to making a monetary allocation. Thus, we conclude that these questions are unlikely to specifically represent an omitted characteristic of importance to allocation decisions. Overall, 105 out of 140 questions were categorized into one of the categories with a majority consensus (i.e., 50% or more of participants agreed on a single category), and 35 were split amongst multiple categories (with no one category comprising more than 50%). Importantly, none of the 48 items originating from participants in Study 1c who were asked to generate questions that would be useful in determining a monetary allocation were predominantly categorized by participants in Study 1d as belonging in the "Other" category. This suggests that the four existing categories of liking, similarity, need, and deservingness seem to be comprehensive in covering factors that people would spontaneously choose to consider when deciding on a monetary allocation.

Table 1 lists the number of questions that were placed into each category by the majority of participants, as well as the average percentage of people that had instead described these questions as belonging to one of the other categories. From this table, we can see that similarity was the most frequently chosen category. Examining the cross-classification data reveals that need and deservingness are perceived as more closely related to each other than to liking or similarity. For items that were classified by the majority of participants into the need or deservingness category, 18% and 29% of participants classified them into the other of these two categories, whereas less than 5% of participants described them as relevant to liking or similarity. Conversely, liking and similarity are perceived as more closely related to each other than to need or deservingness. For items classified by the majority of participants into the liking or similarity category, 27% and 22% of participants classified them into the other of these two

categories, whereas less than 9% of participants described them as relevant to need or deservingness.

	Need	**Deservingness**	**Liking**	**Similarity**	**None (no category > 50%)**	**Other**
Total number of questions that were classified by > 50% of participants as:	**24**	**12**	**10**	**59**	**35**	**0**
Mean % of participants classifying these questions as need	**72.07**	28.87	0.85	1.53	16.30	
Mean % classifying these questions as deservingness	18.08	**62.68**	8.03	1.58	20.97	
Mean % classifying these questions as liking	3.22	3.29	**59.86**	22.85	24.87	
Mean % classifying these questions as similarity	4.17	3.52	26.76	**66.70**	28.45	
Mean % classifying these questions as other	2.46	1.64	4.51	7.35	9.42	

Table 1. Percentage of participants in Study 1d classifying questions into each characteristic category, grouped by majority category.

Studies 1e and 1f: Generation and Categorization of Questions Pertaining to Other Factors

As a final check to ensure that people do not think of any other factors when making decisions about monetary allocations, a new sample of 50 participants from Amazon Mechanical Turk was asked to generate questions they might ask to help them decide about a monetary allocation to another person, but that specifically *would not* provide answers about any one of the four categories of need, deservingness, liking, and similarity. This study was run to address the possibility that although it may not immediately come to mind as one of their top 3 questions,

people still do consider other target characteristics over the course of an allocation decision that would be important to include in our main study. The study design was identical to that of the condition in Study 1c where participants were asked to generate a question relevant to a monetary allocation. However, in this case, participants also read a supplementary instruction not to provide questions related to any of the four categories of liking, similarity, need, and deservingness. This resulted in a total of 54 unique questions, which were categorized in Study 1f by 71 participants from Amazon Mechanical Turk using the same methods and categories used in Study 1d.

Results

Despite the explicit instructions in Study 1e to think of questions that would not provide information about liking, similarity, need, or deservingness, 25 out of 54 of the questions were in fact categorized by over 50% of participants in Study 1f as belonging to one of these four categories. Only 4 out of the remaining questions were classified by greater than 50% of participants into the "Other" category, with the rest being mixed (i.e., without majority agreement as to a single category). [4] Thus, it was concluded that the four categories identified do, with reasonably high certainty, cover the space of interest in identifying target characteristics relevant to monetary allocation.

Summary of Studies 1a-1f

[4] The 4 questions classified as "other" by a majority of participants were: "Who was the 8th president of the US?" "What flies without wings?" "What is the correct order of operations in math?" and "What's your name?" Additionally, a follow-up study was conducted asking participants to generate questions relevant to allocation decisions for a future self (rather than another person). Classification of these questions did not result in the identification of any additional categories.

The overall strategy of the current research is to examine the relative influence of certain factors on intra- and interpersonal tradeoffs, with the aim of identifying whether people rely on these factors to the same extent when making decisions affecting future selves and other people. To ensure that valid results are obtained, it is important that we first consider the complete set of characteristics that people incorporate in such decisions, so that these can then be manipulated in parallel ways for both types of targets. If some influencing elements were inadvertently omitted, this might lead to erroneous conclusions about the relative weight placed on the factors that were presented. To this end, Studies 1a-1f provided an empirical validation of the importance of four characteristics drawn from the previous literature (liking, similarity, need, deservingness). Both a lab-based think-aloud procedure as well as a free-response question generation followed by categorization by online participants were used to confirm the relevance of these characteristics. Results indicated that people would consider elements falling into all four previously-identified categories when faced with an allocation decision. In addition, no queries falling outside of these categories were consistently identified, suggesting that these categories did indeed seem to be exhaustive with regards to the types of information considered in relation to allocation decisions.

STUDY 2: SELF-REPORTED IMPORTANCE OF INFORMATION FOR ALLOCATION DECISIONS

In Study 2, participants viewed a sample of questions generated by participants in Study 1c and ranked them based on perceived informational value for an allocation decision. We compared rankings in the condition where the potential recipient was another person with the condition where the potential recipient was the future self. This allowed us to examine whether people expect that the information provided by different categories of questions would be equally useful whether making an allocation decision for these two types of targets. Performing

this study also allows us to compare the perceived importance of various target related factors (for both future selves and others) with the actual weightings of these factors in allocation decisions, as measured in Study 5.

Method

Three hundred and twenty-eight participants from Amazon Mechanical Turk completed a survey in return for monetary compensation. Participants completed a ranking task twice in counterbalanced order, once in which they were asked to make judgments regarding an allocation to another person that was unknown to them, and once in which they were asked to make judgments regarding an allocation to the future self in five years' time.[5] The ranking task consisted of placing 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 other person or future self (with 1 corresponding to most useful, and 8 corresponding to least useful). The questions presented were the two questions from Study 1c that had been judged as the most relevant to each category (liking, similarity, need, deservingness) by a separate sample of participants who were not aware of the allocation context (see Table 2 for listing of questions used). Questions were presented in randomized order in Study 2, and participants were not aware of the four categories from which they were drawn. In making their rankings, participants were instructed to assume that they would receive an honest answer to any question that was asked.

Questions for Need Category	**Questions for Deservingness Category**

[5] The time period of 5 years was chosen because it was the shortest time period for which the majority of participants in a pre-test reported that it was plausible that their future self could be significantly changed from the current self in terms of all dimensions of liking, similarity, need, and deservingness. If participants did not plausibly believe that they could have changed on these factors, receiving information about these future attributes would not be useful to them in making a decision, since the information would ostensibly already be known given qualities of the current self. In the current studies, we wanted to ascertain that the future self was imagined at a temporal distance where enough change could have occurred to conceivably treat this target as if it were another person.

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?
Questions for Liking Category	**Questions for Similarity Category**
Do you treat people nicely?	What are your interests?
What does friendship mean to you?	What are your hobbies?

Table 2. Listing of questions used in Study 2.

Results

Order effects. Initial analyses revealed a significant order of target presentation*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 of target presentation*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, $\eta_p^2 = .006$. Therefore, to eliminate any possibility of confounds due to order effects, only the responses for the first target presented to each participant were considered in the subsequent analysis.

Comparison of question rankings for future self versus others. 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 indicates that people assigned different patterns of relative utility to the different categories 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 and similarity was relatively more important (i.e., lower rankings), than when the target was another person (see Figure 1). In contrast, when the target recipient was another person, people reported that information about deservingness and liking was relatively more important than when the target was the future self. However, it is important to note that across both types of targets, information about both need and deservingness (mean ranking = 3.34, SD = 1.21) was consistently considered to be more important than information about both liking and similarity (mean ranking = 5.66, SD = 1.21; $t(327) = -17.36$, $p < .001$).

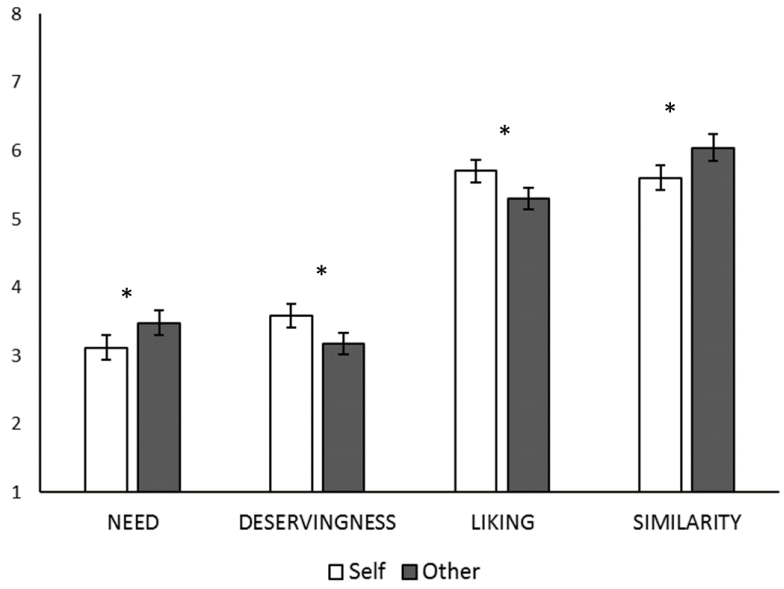


Figure 1. Comparison of average rankings of importance for questions from different categories for determining allocation decisions. A ranking of 1 reflects highest importance and a ranking of 8 reflects lowest importance. Significance testing was performed by computing Wilcoxon-Mann-Whitney test statistics and adjusting for multiple comparisons. * $p < .05$

Summary

Study 2 provided a first test of whether people consider the same factors when thinking about giving to a future self versus another person. Self-reported rankings of the importance of

information related to the four categories of liking, similarity, need, and deservingness revealed a fundamental parallel for both targets where need and deservingness were judged as considerably more important than liking or similarity. Nevertheless, significant differences between judgments for the future self and others did emerge in a more nuanced analysis of the ranking distributions. This revealed that, at least for the specific subset of eight questions provided, people considered information pertaining to need and similarity to be relatively more important for the future self, but information pertaining to deservingness and liking to be more important for others. This study did not assess the reasons behind people's selections. However, one possible reason for this self-other difference could be that people assume there will be less variation in liking and deservingness for a future version of themselves (i.e., they would be high on both) than for another person (i.e., they could be either high or low). As a result, information about these factors could be considered relatively more useful for decisions about others.

STUDY 3: ASSESSING THE UNDERLYING STRUCTURE OF OTHERS AND FUTURE SELVES

The results of Study 1 suggest that the characteristics people report considering when making allocations to either the future self or others consistently fall into the four categories of liking, similarity, need, and deservingness. Furthermore, people report that they would weight these characteristics differently in their allocation decisions: in Study 2, need and deservingness were consistently ranked as more informative than liking and similarity. The central manipulation in the current research will examine the actual effect of these characteristics on allocations. In doing so, their relative influence in cases where the target is the future self can be directly compared with cases where the target is another person.

In order to obtain an accurate measurement of the impact of all four attributes of liking, similarity, need, and deservingness, it is important to verify that these can be independently varied across our sample of targets, for both the self and other. Although participants in Studies 1d and 1f categorized questions into all four categories, we have not yet ascertained whether people in fact consider these characteristics to be distinct attributes (a view which would likely be based on their perceived pattern of co-occurrence in real-life targets). This is important because if two characteristics (for example liking and similarity) are always extremely highly correlated in the targets considered, it would be difficult to separate the influence of each of these on allocation decisions.

Study 3 examines whether the characteristics of interest are meaningfully separable for both types of targets by evaluating whether, for any given pairing of the four characteristics, people can successfully generate others or future selves falling into all cells of a 2x2 matrix crossing high and low levels of each characteristic. If there is any pairing where participants are unable to generate all combinations of characteristics (for example, if participants could not successfully envision a person who is highly similar to them and that they do not like), this would suggest that these characteristics effectively form a single dimension for this type of target (self and/or other). This study will reveal whether the future self can in fact be described using a similar set of characteristics as used to describe other people, or whether the underlying structure of these two types of targets is perceived to be fundamentally different.

Method

One hundred and eighty participants from Amazon's Mechanical Turk completed the study for monetary compensation. Participants were told that they would be completing a survey about their perceptions of others or of themselves (manipulated between subjects). In addition to

being randomly assigned to either the self or other condition, each subject was also randomly assigned to one of six conditions representing a different pairing of characteristics: liking/similarity, liking/need, liking/deservingness, similarity/need, similarity/deservingness, or need/deservingness. Participants were asked to think of an example of someone they are personally acquainted with (for those assigned to the "other" condition) or a version of their future self in 5 years (for those assigned to the "self" condition) that could be categorized into each cell of a 2x2 matrix crossing high and low levels of each characteristic. That is, a participant in the liking/similarity condition evaluating others was asked to state the first name and relationship to them (e.g., friend, family member, coworker) of four different individuals fitting the following categories: (1) "someone you personally know who you like very much and who is very similar to you," (2) "someone you personally know who you like very much and who is not at all similar to you," (3) "someone you personally know who you do not like at all and who is very similar to you " and (4) someone you personally know who you do not like at all and who is not at all similar to you." Participants in the "self" conditions were asked to imagine and write a short description of four versions of their future self who satisfied the specified combinations of characteristics. Within each characteristic-pair condition, the other two non-manipulated characteristics were not mentioned during the target generation phase.

An additional manipulation used in the "self" condition only was whether participants were provided with an absolute version of the prompt, which stated that the future self should be high or low on the given characteristics, versus a relative version of the prompt, which stated that the future self should be higher or lower than the current self on the given characteristics. For example, an absolute version of a prompt in the "need/deservingness" condition read "You learn that the person you will be in 5 years is very much in need of money and is very deserving of

money," whereas the corresponding relative prompt read "You learn that the person you will be in 5 years is much more in need of money than your current self and much more deserving of money than your current self." Absolute and relative versions of the future self-related prompts were compared to determine whether one was more effective than the other at producing targets that were separable along the dimensions of interest (note however, that similarity, an inherently relative concept, was manipulated in relative terms in both conditions). This variation in prompt was suggested by the idea that whereas characteristics of target others are often manipulated using methods that are not self-referential, previous experimental work on the future self has often made explicit comparisons to the current self, perhaps due to its focus on similarity as a dimension of interest. Results of this wording manipulation are discussed in the "Analysis by Target" portion of the results section.

Dependent variables. Regardless of the two characteristics that had been manipulated, participants provided ratings of liking, similarity to the current self, need, and deservingness for every target they generated (all ratings were made in a separate block after the generation of all targets was complete). Ratings in all conditions were made in absolute terms on a sliding scale of 0 (not at all) to 100 (very much), for ease of comparability across conditions.

Results

The goal of this study was to determine whether each characteristic defines a separate conceptual space within the targets of interest. In other words, would participants be able to think of an acquaintance or a version of their future self that fulfills all combinations of the characteristics, or are some characteristics dependent on each other in a way that prevents them from varying independently?

Overall, there were high correlations between each manipulated factor and ratings on non-manipulated factors, with the exception of need (see Table 3). This suggests that, for liking, similarity, and deservingness, targets generated to be high (or low) on one of these factors were also rated as high (or low) on the other two. However, as a more sensitive test, we also examined whether the within-participant variance of ratings across the targets generated was higher for manipulated versus non-manipulated characteristics. For example, the variance in similarity ratings across the four targets provided by a participant who was in the "similarity/need" condition (where similarity is a manipulated to be high and low across targets) should be larger than the variance in liking ratings (a non-manipulated characteristic) for this same participant. If this were found to be the case, this suggests that the idea of separately manipulating and examining the influences of these characteristics is reasonable, since the manipulation does in fact produce some independent movement of the manipulated characteristic. If, however, liking (non-manipulated characteristic) varies as much as similarity (manipulated) within this participant, this would suggest that it may not be meaningful to independently examine the influence of these two characteristics on allocations.

Across all types of targets generated (other and self), the average within-subjects variance in target ratings was indeed significantly larger in conditions where the rated characteristic was manipulated than in conditions where it was not manipulated (see Table 4). This suggests that when people are asked to think of people that are high or low on a certain characteristic, they can indeed generate individuals that vary more on this specific dimension than on the non-manipulated characteristics.

		Manipulated Characteristic			
		Liking	Similarity	Need	Deservingness
Non-manipulated Characteristic	Liking	--	0.580 ***	-0.06	0.651 ***
	Similarity	0.715 ***	--	0.122	0.526 ***
	Need	0.083	-0.004	--	-0.084
	Deservingness	0.668 ***	0.422 ***	0.231 **	--

Table 3. Average within-subjects correlations between manipulated and non-manipulated characteristics. Results are collapsed across all types of targets (self and other) from Study 3.

	LIKING	SIMILARITY	NEED	DESERVINGNESS
	Mean within-subjects variance in generated targets	Mean within-subjects variance in generated targets	Mean within-subjects variance in generated targets	Mean within-subjects variance in generated targets
MANIPULATED	1918.4	1394.7	1933.1	1605.0
NON-MANIPULATED	1173.7	1122.3	1016.8	1016.5
t	5.19	2.14	6.30	4.32
p	<.001	.034	<.001	<.001

Table 4. Within-subjects variance for manipulated and non-manipulated characteristics in Study 3. Rating of each characteristic was made on a 0-100 scale.

An analysis of mean ratings also verified that the manipulations moved ratings of targets significantly in the intended direction. Furthermore, the mean levels of one manipulated characteristic did not vary significantly based on the other manipulated characteristic that it was paired with. For example, participants who were asked to generate targets high in liking (M=78.46, SD=22.54) subsequently stated that they liked these individuals significantly more than targets that were meant to be low in liking (M=19.34, SD=20.81), $t(92)=16.38$, $p < .001$, $d = 1.70$. The size of this difference did not significantly vary based on whether the other characteristic manipulated in conjunction with liking for that participant was similarity, need, or

deservingness, $F(2, 366) = 0.71$, $p = 0.49$. Similar results were obtained for the other three characteristics (see Table 5 and Figure 2).

	LIKING	SIMILARITY	NEED	DESERVINGNESS
High minus low conditions	M diff = 59.12 $t(92) = 16.38$ $p < .001$, $d = 1.70$	M diff = 40.75 $t(88) = 11.00$ $p < .001$, $d = 1.17$	M diff = 60.71 $t(89) = 16.89$ $p < .001$, $d = 1.78$	M diff = 52.93 $t(87) = 15.28$ $p < .001$, $d = 1.63$
Interaction with other manipulated characteristic	$F(2, 366) = 0.71$ $p = 0.49$	$F(2, 350) = 0.73$ $p = 0.48$	$F(2, 267) = 0.35$ $p = 0.71$	$F(2, 261) = 1.06$ $p = 0.35$

Table 5. Mean difference between manipulated high and low conditions for all characteristics in Study 3. Ratings of each characteristic was made on a 0-100 scale.

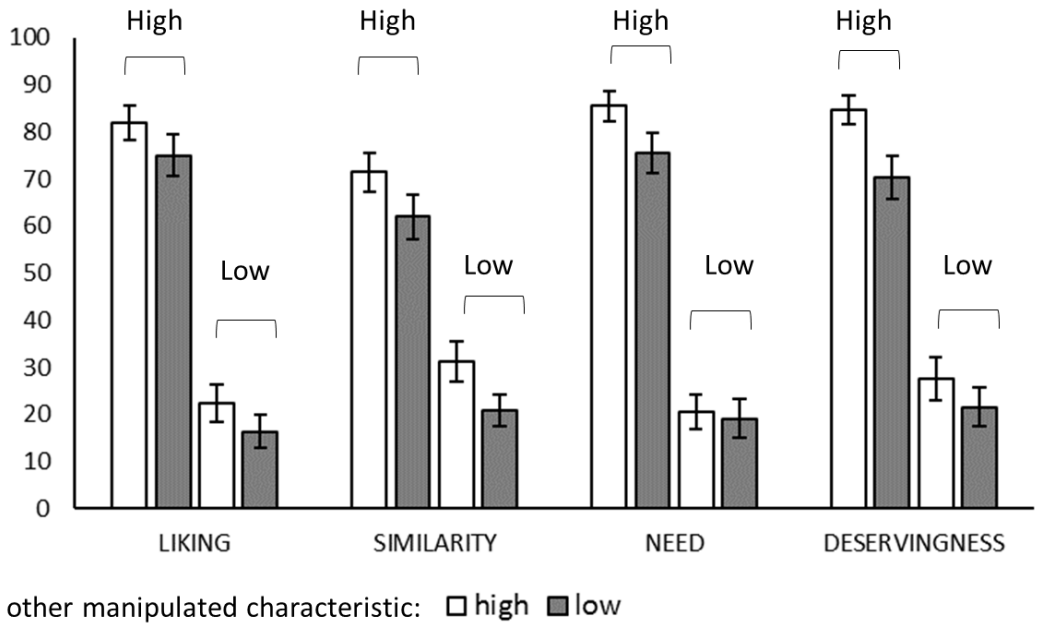


Figure 2. Mean rating and 95% CI for each characteristic across four target conditions (results collapsed across both self and other). Bracket labels indicate manipulated levels of the characteristic indicated on the x-axis. Legend indicates levels of the other manipulated characteristic.

Analysis by target. The finding that manipulating a characteristic increased the variance of responses for that characteristic did not differ with the type of target considered (self versus other) for any of the four characteristics (liking: $F(2, 174)=1.33$, $p=0.27$, $\eta_p^2=.015$, similarity:

$F(2, 174)=1.82$, $p=0.17$, $\eta_p^2=.020$, need: $F(2, 174)=1.82$, $p=0.16$, $\eta_p^2=.021$, deservingness: $F(2, 174)=0.36$, $p=0.69$, $\eta_p^2=.004$). Furthermore, the effect of high/low manipulations on mean ratings did not significantly differ based on whether the target was another individual or a version of the future self for any of the four characteristics of liking ($F(2, 366) = 2.26$, $p = 0.11$), similarity ($F(2, 350) = 0.61$, $p = 0.54$), need ($F(2, 267) = 1.79$, $p = 0.17$), or deservingness ($F(2, 261) = 0.55$, $p = 0.58$). These findings suggest that people were able to successfully generate targets that independently vary on all four characteristics both for other individuals and for versions of the future self in 5 years.

Despite the overall lack of interaction effects, we analyzed the data separately by target in order to select between the absolute and relative wording conditions for future self targets. It was found that the variance of similarity ratings was higher when similarity was a manipulated (vs. non-manipulated) characteristic only in the "self relative" condition (M var=1330.92 vs. 723.38, $t(57) = 3.30$, $p=.002$, $d=0.85$) and there was no difference between these variances in the "self absolute" condition (M var=1446.30 vs. 1406.44, $t(57) = 3.30$, $p=.608$, $d=0.14$). A similar pattern was found for deservingness ratings. This suggests that similarity and deservingness may be confounded with other characteristics when absolute wording is used to describe the future self. Therefore, for subsequent studies, the relative wording version is used for manipulations of the future self, in order to provide a cleaner separation of the four characteristics of interest.[6]

[6] When looking separately at the absolute and relative versions for generating the future self, an interaction between target (self vs. other) and manipulated vs. non-manipulated factor emerged for the relative (but not absolute) version on the variance of similarity ratings. This suggests that the absolute version of the prompt might yield results that are slightly more similar to those where the target is another person. However, because the general pattern of results was similar between the two versions, and because the relative version appeared to create a clearer separation of ratings across conditions, we chose to use the relative version for the wording in Study 5.

Type of relationship between participants and generated others. The relationships that participants reported for the third-party targets they generated were also examined in order to see whether there was any association between the manipulations of characteristics and the types of targets named. Targets were classified based on whether the participant had described them as a relative or romantic partner, a friend, or another type of more distant social relationship (frequent types of "other" relationships included co-worker, acquaintance, and neighbor). Overall, participants were more likely to name either a relative, romantic partner, or friend in the high (rather than low) liking conditions (75.8% vs. 30.6%, $\chi^2 = 23.61$, $p < .001$) and the high (rather than low) deservingness conditions (78.1% vs. 57.8%, $\chi^2 = 5.17$, $p = .023$. However, there was no difference between high and low need or high and low similarity conditions in the frequency with which participants named these types of targets (see Table 6). This suggests that, although we did not directly manipulate social role, some aspects of these roles are likely being captured by the manipulation and measurement of liking and deservingness. Possible influences of social role on allocations are further addressed in the General Discussion.

		Relative or Romantic partner	Friend	Other	
Liking	High	32.2%	43.5%	24.2%	100%
	Low	21.0%	9.7%	69.4%	100%
Similarity	High	19.7%	47.0%	33.3%	100%
	Low	18.2%	39.4%	42.4%	100%
Need	High	31.7%	35.0%	33.3%	100%
	Low	31.7%	36.7%	31.7%	100%
Deservingness	High	43.8%	34.4%	21.9%	100%
	Low	28.1%	29.7%	42.2%	100%

Table 6. Percentage of third-party targets generated in Study 3 that fell into each of 3 types of relationships to the participant.

Study 3 Summary

The results of Study 3 suggest that liking, similarity, need, and deservingness do indeed describe distinct attributes of both others and the future self. In other words, people can name individuals both high and low on each characteristic, regardless of levels of the other characteristics. Thus, we conclude that liking, similarity, need, and deservingness can be meaningfully tested for their individual influence on allocations. In addition, participants are more likely to name relatives, romantic partners, or friends (rather than more distant acquaintances) when asked to generate targets that are high (rather than low) in liking and deservingness, suggesting that varying these characteristics is likely to capture some of the effects of social roles on allocations.

STUDY 4: TESTING CALIBRATION OF INTRAPERSONAL AND INTERPERSONAL TARGETS

Although Study 3 demonstrated that people were able to generate targets across all combinations of the relevant characteristics for versions of the future self as well as for acquaintances, this finding does not necessarily ensure that people consider future selves and others to fall within similar ranges of these characteristics. Notably, participants in Study 3 generated and rated targets that corresponded to the future self or others, but not both. Because ratings of liking, similarity, need, and deservingness were all reported on subjective 0-100 scales, it is possible that participants used this scale differently when making ratings of future selves versus others. For example, participants in the future self condition may have mentally equated the lower endpoint of the "liking scale" to the lowest amount they could imagine liking themselves, whereas those in the "other" condition may have considered this point to represent the least amount they could imagine liking another person. If, for example, liking of future selves

were systematically greater than liking of others, a participant who rated an acquaintance as a 50 on this scale may in fact feel less favorable towards them than someone who rated their future self as a 50, due to different interpretations of the scale values. In order to minimize this type of discrepancy in ratings, in subsequent studies, participants provide ratings of both future selves and others on the same page and are instructed to use the same rating scale.

Because we will mainly be using actual self-reported values of liking, similarity, need, and deservingness as predictors of allocated amounts (rather than coding by condition), it is not a problem if, in general, there is a correlation between target type and ratings (for example, higher similarity on average between future self and current self than between current self and other). However, an issue would arise in the analysis if, for one or more characteristics, the relationship between target type and characteristic was in fact much larger than the relationship between our manipulations and each characteristic. To present an extreme example: imagine that when rated on the same scale, liking of future selves was always reported to be between 80-100 regardless of our manipulations whereas liking of others was always reported to be between 0-20. In this case, it would not be possible to properly extrapolate what allocations would be for a future self and another person equivalent on liking. In this example, liking and nature of the target would be confounded to such a degree that it would be impossible to differentiate whether any allocation difference was due to the difference in liking or another aspect of the difference between future selves and others.

Therefore in Study 4, each participant generated and rated targets consisting of other people and versions of the future self. The variation in each characteristic due to the manipulations was then compared to its variation due to the type of the target. The goal of this study was to ensure that the manipulations would result in an adequate range of variation in

characteristics for both types of targets to meaningfully use these as predictors of allocations in Study 5.

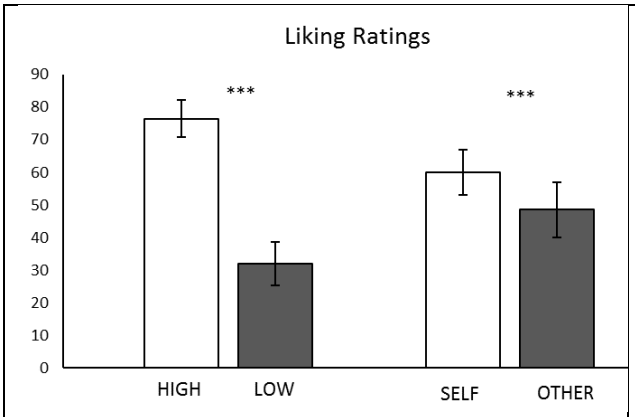
Method

Seventy-nine participants from Amazon Mechanical Turk completed the study for monetary compensation. Participants were assigned to one of 6 conditions representing pairs of the four characteristics of interest, as in Study 3 ("liking/similarity, "liking/need", "liking/deservingness," similarity/need," "similarity/deservingness," "need/deservingness"). They were asked to generate four targets each for *both* the other and self that populated all cells of a 2x2 matrix representing high and low levels of the two characteristics for their condition (i.e., high/high, high/low, low/high, low/low). Participants were then presented with pairs of individuals they had generated consisting of one interpersonal and one intrapersonal target which had been elicited so as to fall within the same range of characteristics. For example, if the participant had suggested Joe as an acquaintance that met the conditions of high liking and high similarity, she would be presented with Joe and the high liking/high similarity version of future self side by side, each with a corresponding scale for liking, similarity, deservingness, and need. This participant would be instructed to complete the ratings for both Joe and the presented version of the future self using the same rating scales for each. This process was repeated for all corresponding interpersonal/intrapersonal pairs, in randomized order.

Results

It is not expected nor intended that the interpersonal and intrapersonal targets from parallel conditions will be rated exactly the same on each characteristic. However, as mentioned previously, if ratings vary too much by the nature of the target type (i.e., self/other), it will not be possible to separate the effects of the manipulated attribute from the identity of the target. In

order to ensure that the self/other distinction did not unduly influence ratings more than the intended manipulations, we looked at each characteristic across all the conditions in which it was manipulated (e.g., for measures of liking, we looked at the three conditions involving liking: "liking/similarity", "liking/need", and "liking/deservingness"). Within these conditions, the size of the average difference in ratings of the manipulated characteristic between all targets that were intended to be high versus low on the characteristic was compared with the average difference between all targets that were versions of the self versus versions of the other. In order to ensure that our high/low manipulations are not overpowered by the influence of the self/other condition, we verified that the size of the former difference was significantly larger than the latter difference for each manipulated characteristic. The comparison of these two differences was significant for all characteristics. (See Figure 3)

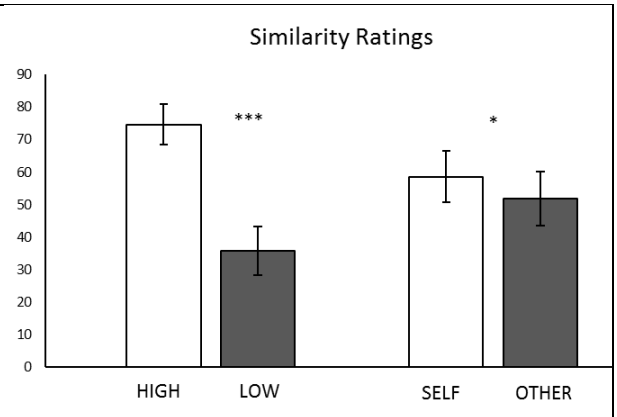


Contrast of differences:

M diff high vs. low = 44.41, 95% CI=[38.02, 50.81]

M diff self vs. other = 11.37, 95% CI=[6.22, 16.52]

$t(163) = 7.68$, $p < .001$



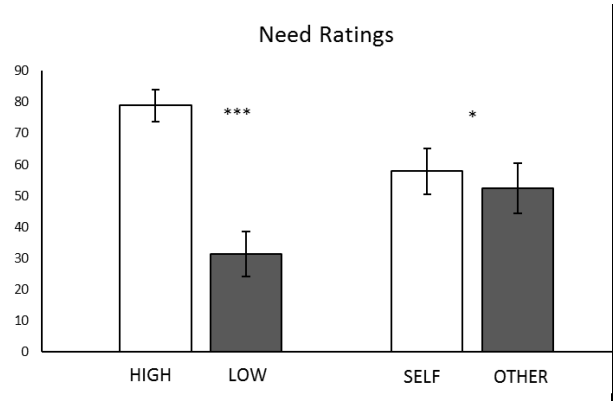
Contrast of differences:

M diff high vs. low = 39.00, 95% CI=[32.24, 45.76]

M diff self vs. other = 6.76, 95% CI=[1.42, 12.09]

$t(139) = 6.91$, $p < .001$

Figure 3. Contrasts of differences in each characteristic due to manipulations versus difference in each characteristic due to target identity (self versus other; Figure continued on next page).

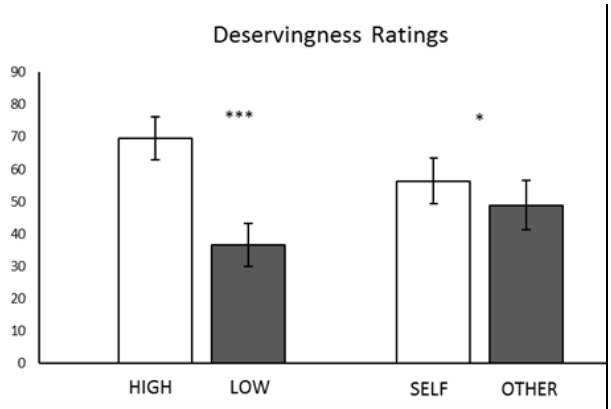


Contrast of differences:

M diff high vs. low = 47.66, 95% CI=[41.19, 54.12],

M diff self vs. other = 5.49, 95% CI=[0.90, 10.09]

$t(159) = 8.97$, $p < .001$



Contrast of differences:

M diff high vs. low = 39.45, 95% CI=[32.99, 45.91]

M diff self vs. other = 7.24, 95% CI=[3.08, 11.40],

$t(167) = 3.43$, $p < .001$

Figure 3 (continued). Contrasts of differences in each characteristic due to manipulations versus difference in each characteristic due to target identity (self versus other).

Study 4 Summary

Because we indeed found that the difference between high and low conditions for manipulated characteristics is larger than the self-other difference, we can assume that the characteristics are varying in the intended direction for reasons that are not solely confounded with the self/other distinction. In other words, the difference in attribute ratings related to self-other differences are not so large as to negate the differences suggested by the manipulation. Across the four characteristics measured, the average difference in ratings related to the manipulations was between 3.91 times (for liking) and 8.68 times (for need) larger than the average difference due to target type. Therefore, the difference in ratings related to target type is

unlikely to interfere with the assessment of the effects of the four attributes of liking, similarity, need, and deservingness on allocations.

STUDY 5A: HYPOTHETICAL ALLOCATIONS TO OTHERS AND FUTURE SELVES

The previous studies in this paper support several assumptions that underlie the regression analyses in Study 5. Studies 1 and 2 suggest that people would seek information related to liking, similarity, need, and deservingness of a target when considering an allocation decision. Study 3 confirmed that people are able to generate both a) others known to them and b) possible versions of their future self that independently vary on the four factors of interest. This justifies examining each of these as separable influences on allocations. Study 4 verified that the manipulation of each characteristic results in a range of perceived differences in each characteristic that is not eclipsed by any differences in characteristics related to the target type (self or other). Study 5 will thus assess the relative influence of each factor on allocations to others and different imagined versions of future selves. This will complement and extend the results of people's self-reported perceptions of the importance of these characteristics (from Study 2) into an actual decision context.

In Study 5, we use a multiple regression analysis to examine the weights given to all personal attributes (similarity, liking, need, deservingness). Of particular note, we examine whether there is an interaction between the type of target (future self vs. other) and any of the characteristics considered. If so, this would indicate that the future self is in fact treated differently from another person when it comes to the factors considered in making allocation decisions. This would suggest that even if the outcome of a decision for the future self is similar to that of a decision for another person (as seen in studies such as Pronin et al., 2008), the underlying process may be different (and potentially responsive to different types of

manipulations and interventions). In contrast, if there are no interactions between the self/other variable and any of the characteristics examined, this would suggest that people use the same decision criteria for intrapersonal and interpersonal allocations.

Method

One hundred and eighty participants were recruited via Amazon Mechanical Turk to complete the study. Two participants were excluded after reporting technical difficulties completing the survey, leaving a final N of 178. As in Studies 3 and 4, each participant was randomly assigned to a condition corresponding to one 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 acquaintances, and four targets consisting 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 corresponding to their assigned between-subjects condition. For example, a participant assigned to the need/deservingness condition would be asked to generate 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 (see Appendix A for full text of prompts). 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).

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 pages of rating scales where they reported perceived liking, similarity to the current self, need, and deservingness of the four types of targets for both the other and the future self. (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 demand effects related to the condition in which each target had been elicited). 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, and participants 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 high need/high deservingness prompt, and would reply to questions about liking, similarity, need, and deservingness for each (order of columns and slider questions was randomized).

Results

Distribution of allocations. Each participant made 8 allocations, resulting in a total of 1424 allocations (712 to future selves and 712 to others). The distribution of allocations was 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). This distribution looked similar when people gave to future selves and to others, though more people chose to give the entire amount to their future self (157 out of 712 allocations) than they did to others (112 out of 712

allocations; $\chi^2 = 8.87$, $p = .003$, 95% CI = [.021, .105]; see Figure 4). Table 7 shows the average amount allocated to the target (collapsed across both self and other) for high and low levels of each target characteristic.

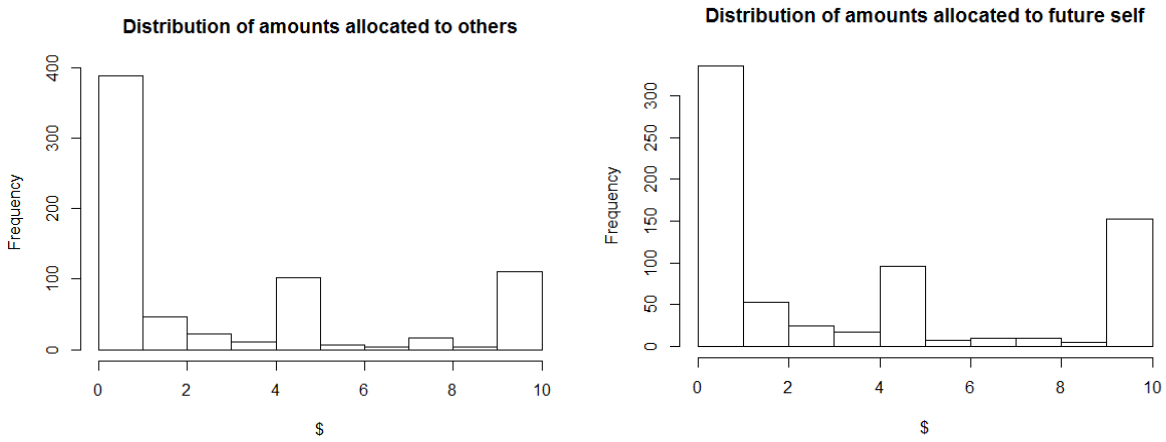


Figure 4. Distribution of amounts allocated to others and future self in Study 5a.

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 7. Mean amounts allocated to target in Study 5a based on manipulated levels of target characteristics (collapsed across self and other targets).

Effects of target characteristics. Four continuous variables representing the participant's ratings of liking, need, similarity, and deservingness, along with a binary variable representing the type of target (future self vs. other) were entered into an initial linear regression

predicting each allocation amount. Ratings of all four target characteristics were centered prior to entering them into the regression, and a random intercept was included for each participant to account for repeated measurements. In other words, the model reflects a multilevel structure with targets nested within participants. The participant-generated ratings (0-100) for all four characteristics (liking, similarity, need, deservingness) were used as predictors.

Participants' own ratings are considered to be more accurate as actual measures of these characteristics than assigned condition because of several factors. First, the continuous rather than categorical nature of the ratings allows for more fine-grained distinctions than would be provided by using the assigned condition. These ratings can reflect differences in targets related to idiosyncratic generation between participants (e.g., one participant's acquaintance generated in a "disliked" condition may be someone he merely feels neutral about, whereas another participant's "disliked" acquaintance may be someone she truly hates). Finally, 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. Thus, using participants' own ratings provides predictor values corresponding to all four characteristics of interest for each target, whereas using assigned condition as the predictor would only provide information about two characteristics for each target.

The results of the initial regression model (as displayed in Table 8) suggest that the amount of money allocated to each target is significantly related to all four target characteristics as well as the type of target (other or self). On average, participants allocated $2.91 to targets representing other people and $3.57 to the future self when controlling for all four target characteristics. Furthermore, for each 1 unit increase on the 100-point rating scale, participants allocated an additional 1.0 cents to targets for increases in liking, 0.9 cents for increases in

similarity, 1.5 cents for increases in need, and 3.1 cents for increases in deservingness. The fact that a significant effect of target (65 cents increased allocation to the future self compared to others) remains after controlling for all four target characteristics provides initial evidence suggesting that there is a quite large difference between future selves and others that affects allocations but is *not* being captured by differences in any of the four characteristics measured. This influence of target type on allocations is equivalent to approximately 65 points on the 0-100 liking scale (1.72 standard deviations), 72 points on the similarity scale (2.06 standard deviations), 43 points on the need scale (1.16 standard deviations), or 21 points on the deservingness scale (0.56 standard deviations). Measures of the size of the effect uniquely explained by each variable are presented in Table 9.

Study 5a Regression Model 1: Fixed Effects					
	Estimate	*Std. Error*	*Df*	*t value*	*p value*
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 8. Fixed effects estimates from Study 5a Model 1.

Study 5a Regression Model 1: Marginal R^2 Values			
Effect	R^2	*Upper CL*	*Lower CL*
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 9. Marginal R^2 values (effect size measures) for model and individual effects from Study 5a Model 1.

Target by characteristic interactions. A second model was constructed which added the interaction of target type with each of the four characteristics (see Tables 10 and 11). This model showed only a significant interaction between target and need. In this case, a one-point increase in need was related to a 2.0 cent increase in future self-related allocations compared to a 1.1 cent increase in other-related allocations (i.e., a 0.9 cent difference in the rate of increase between types of targets, $t(1294) = 2.00$, $p = 0.046$, marginal $R^2 = 0.002$). Although an increase in need has nearly twice the effect on allocations to the future self as it does on allocations to others, the marginal variance (R^2) explained by this effect is quite low, suggesting that it does not in fact contribute very much to the overall explanatory model. This suggests that although allocations are generally larger for the self than for the other due to factors unexplained by our current model, the influence of the four characteristics is relatively consistent regardless of the type of target. In fact, if the non-significant interactions (target*like, target*similarity, target* deservingness) are removed from the model, the significance of the target*need interaction is

reduced to $p = 0.10$, indicating that the target-driven difference in consideration of need is not very robust. Thus, it seems that people mostly do use target characteristics in similar way when thinking about allocation decisions for future selves and others. Nevertheless, a significant effect of target indicates that there is an additional increase in allocation to future selves relative to those to others that cannot be explained by the effects of the characteristics measured (this idea will be further explored in the General Discussion).

Study 5a Regression Model 2: Fixed Effects					
	Estimate	*Std. Error*	*Df*	*t value*	*p value*
Intercept	2.927	.1647	292	17.77	<.001
Liking (mean-centered)	.015	.0050	1328	3.038	.002
Similarity (mean-centered)	.0077	.0046	1338	1.688	.096
Need (mean-centered)	.011	.0033	1322	3.225	.001
Deservingness (mean-centered)	.0313	.0050	1337	6.397	<.001
Target (0=other, 1=self)	.6508	.1575	1233	4.132	<.001
Liking*Target	-.0010	.0070	1298	-1.433	.15
Similarity*Target	.0024	.0063	1319	0.370	.71
Need*Target	.0092	.0046	1294	1.999	.046
Deservingness*Target	-.0014	.0069	1291	-.199	.84

Table 10. Fixed effects estimates from Study 5a Model 2.

Study 5a Regression Model 2: Marginal R^2 Values			
Effect	R^2	*Upper CL*	*Lower CL*
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 11. Marginal R^2 values (effect size measures) for model and individual effects from Study 5a Model 2.

STUDY 5B: INCENTIVE-COMPATIBLE ALLOCATIONS TO OTHERS AND FUTURE SELVES

The final study was a direct replication of Study 5a, with the exception that the hypothetical allocation instructions were replaced with an incentive-compatible version. Specifically, before making their allocations, participants were informed: "Please note that 25% of participants will be chosen after this study, via a random draw, to actually receive $10 (via MTurk 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." This method was chosen to reduce total costs associated with paying out participants, in light of previous research

suggesting 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).

Method

Participants were 180 workers recruited from Amazon Mechanical Turk in return for monetary compensation. Information about any possible additional payout beyond the normal compensation rate of $1.50 for 15 minutes was not initially provided in the study description. This was done order to avoid self-selection effects that could cause this sample to differ from those who participated in Study 5a. All other procedures, with the exception of replacing wording in the study related to hypothetical payouts with wording related to probabilistic payouts, were identical to those of Study 5a. Five days after the completion of the study, 45 participants from Study 5b 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 a future self) was also randomly chosen and communicated to them as the one that had been chosen to be enacted. Actual enactment of the allocation was left up to the participant, who was informed that, though we could not ascertain that they would carry out the allocation as stated, they were encouraged to do so in order to remain consistent with their previously stated preferences.[7]

[7] Even if participants who were chosen to allocate money to their future self desire to comply with this plan, there is no way to predict whether their future self will in fact resemble the future self imagined in the study in any way. However, our allocation measures were completed during the initial study and prior to participants being informed of whether they had been chosen to enact their allocation and the target they would give to. Thus, whether or how they later enacted the allocation was not necessarily a threat to the validity of our results. Our main goal in providing these instructions was to lead participants to believe, at the time of the allocation *decision*, that their allocations could have real consequences. Of course, the incentive-compatible instructions provided during the study itself were quite vague as to how a chosen allocation would in fact be enacted, and it is possible that participants may have experienced doubts or confusion with regards to its believability. Although we did not directly assess participants'

Results

Distribution of allocations. As in Study 5a, most participants chose not to allocate any money to the target. Those who did choose to allocate most often gave half ($5) or all ($10) of the total amount (see Figure 5). Table 12 shows the average amount allocated to the target (collapsed across both self and other) for high and low levels of each target characteristic.

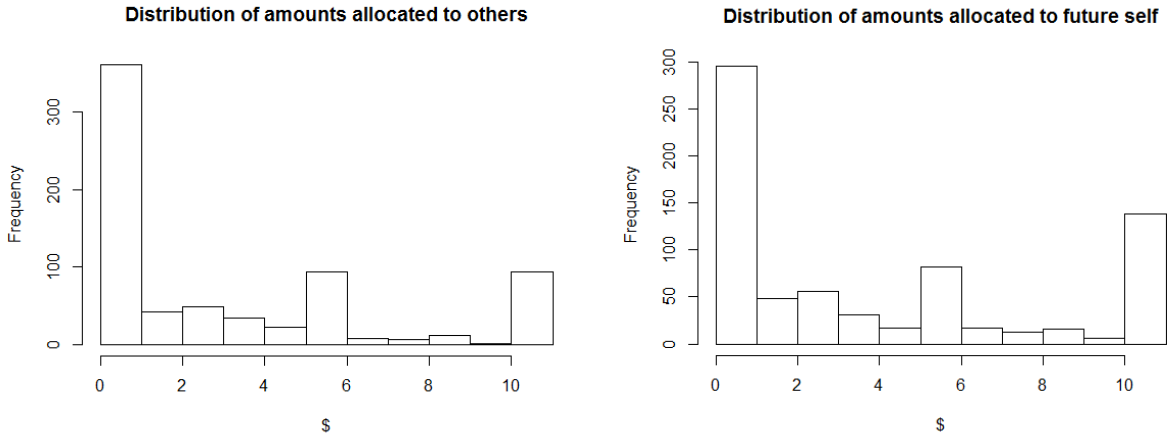


Figure 5. Distribution of amounts allocated to others and future self in Study 5b.

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 12. Mean amounts allocated to target in Study 5b based on manipulated levels of target characteristics (collapses across self and other targets).

beliefs about the logistics of this allocation, no participants brought up questions or suspicions about this procedure in the comments section that was placed at the end of the initial study.

Effects of target characteristics. Data were analyzed using the same regression models as in Study 5a (see Tables 13 and 14). Results indicated that, as in Study 5a, allocations were positively associated with all four target characteristics, with higher allocations being made to those who were judged to be more liked (1.2 cents higher allocation for every 1 point liking increase), more similar to the (current) self (0.8 cents higher allocation for every 1 point increase), more needy (1.1 cents higher allocation for every 1 point increase), and more deserving (2.4 cents higher allocation for every 1 point increase). Nevertheless, even after controlling for all four of these factors, people still allocated almost $1 more on average to a target that was a version of the future self than they allocated to another person ($3.54 allocated to future selves versus $2.58 allocated to others who fell at the mean of all four characteristics; $t(1252) = 6.273$, $p < .001$).

Study 5b Regression Model 1: Fixed Effects					
	Estimate	*Std. Error*	*Df*	*t value*	*p value*
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 13. Fixed effects estimates from Study 5b Model 1.

Study 5b Regression Model 1: Marginal R^2 Values			
Effect	*R^2*	*Upper CL*	*Lower CL*
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 14. Marginal R^2 values (effect size measures) for model and individual effects from Study 5b Model 1.

A second model examining interactions between the target (self or other) and each of the four characteristics revealed no significant interaction effects, suggesting that liking, similarity, need, and deservingness show similar effects on allocation decisions regardless of whether the target of these allocations is another person or a version of the future self (see Tables 15 and 16).

Study 5b Regression Model 2: Fixed Effects					
	Estimate	*Std. Error*	*Df*	*t value*	*p value*
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 15. Fixed effects estimates from Study 5b Model 2.

Study 5b Regression Model 2: Marginal R^2 Values			
Effect	R^2	*Upper CL*	*Lower CL*
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 16. Marginal R^2 values (effect size measures) for model and individual effects from Study 5b Model 2.

Additional Analyses from Studies 5a and 5b

Effects of target characteristics based on assigned condition. The robustness of our results was tested by repeating the regression analyses using assigned condition (i.e., high versus low level of characteristic) as predictors of allocated amounts, rather than participants' own ratings of the targets' characteristics. Combining the results of studies 5a and 5b confirmed that there was no significant difference in allocations (B = -.320, $t(567)$ = -1.35, p = .177) or in the effect of characteristics or target on allocations (all Bs < .304, ps > .157) between the two

studies. Therefore, we pooled both of these studies when analyzing allocations by assigned condition.[8]

Because only two of four characteristics were manipulated for each target, a new variable was created for each characteristic which 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. Both the main effect of each characteristic as well as the characteristic by target type (self or other) interaction were included in a mixed model that nested targets within participants. Note that because predictors can now take on only one of three values, this coding method is less precise as it results in a loss of information when compared to participants' own ratings (which were provided on a scale of 0-100 for each target regardless of assigned condition). However, because participants provided their ratings of each characteristic *after* making their allocation decisions, analyzing by the condition assigned before target generation verifies that our previous results were not a product of reverse causality. If participants' ratings of target characteristics had been affected by their allocations, rather than playing a causal role in them, the previous results would not be replicated when using assigned conditions as predictors.

Results of the model with categorical predictors again revealed that participants allocated a significantly greater amount of money to targets with high levels of each characteristic than those with low levels, as well as replicating the additional influence of target, with higher allocations made overall to the future self than to others. Interaction effects were also directionally consistent with the results obtained using continuous ratings in studies 5a and 5b.

[8] Conducting the analyses separately for studies 5a and 5b did not change the significance of our conclusions.

However, whereas target*characteristic interactions had failed to reach significance in the analyses using participant ratings of characteristics, the analysis by assigned condition 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 (Figure 6; see Appendix B for full results). This analysis provides preliminary evidence that liking and deservingness may be weighted more strongly in determining allocations to others. In other words, the amount of money allocated may vary more when the target is another person than when it is the self in response to equivalent manipulations of liking and deservingness (mean reported levels of liking or deservingness did not significantly differ between self and other within manipulated high and low conditions). Possible interpretations of these findings are addressed further in the Study 5 Discussion.

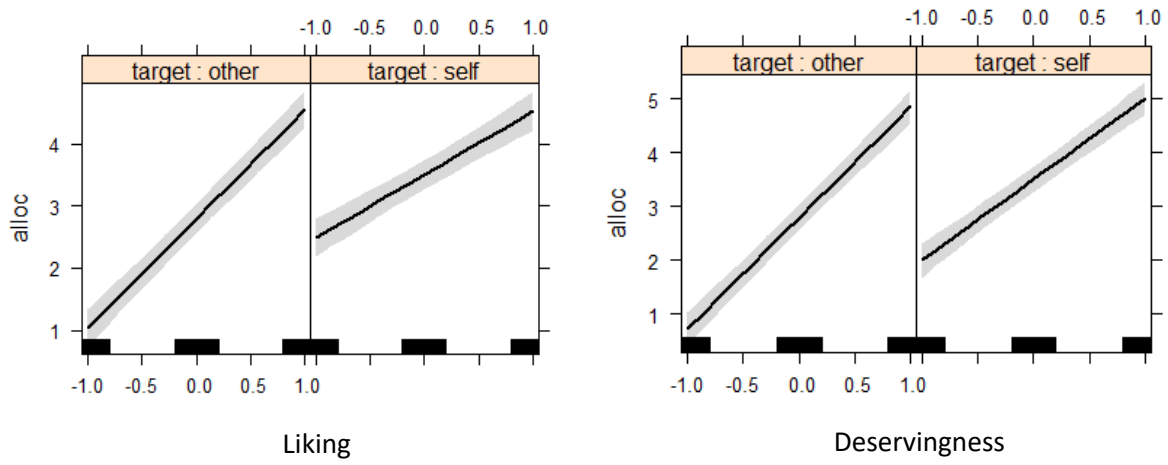


Figure 6. Interaction effects between liking and target and deservingness and target from pooled analysis of Studies 5a and 5b, using assigned level of characteristics as predictor. For levels of liking and deservingness, -1 = low, 0 = not manipulated, and 1 = high.

Specific comparisons of jointly manipulated characteristic pairs. Recall that high correlations were found between several pairs of manipulated and non-manipulated characteristics in Study 3. For example, when liking was manipulated, but similarity was not specifically manipulated, similarity assessments followed liking assessments quite closely (r=0.715). To more directly compare the size of the influence of each of these factors, we performed specific pairwise comparisons of conditions in Study 5 in conditions where these factors were at opposing levels. For example, to compare the influence of liking versus similarity, we compared the high liking/low similarity condition with the low liking/high similarity condition using a paired t-test. The difference in allocations between these two conditions was significant and positive (M =\$4.63 vs. \$2.18; t(51)=5.67, p<.001, d=0.786). This indicates that liking has a larger influence on allocations than similarity (since people allocated more to individuals that were highly liked but dissimilar than to individuals that were disliked but similar). However, we note that the size of this difference was significantly larger when the target was another person than when it was the future self; mean diff = 1.35, t(51)=2.44, p=0.018, d=0.338. This finding is consistent with the interaction observed between target type and liking in the analysis by assigned condition (which indicated that higher amounts were allocated to disliked future selves than to disliked others). The table below lists corresponding results for other pairs of characteristics.

Conditions compared	Pairwise comparison	Stronger factor	Self/other difference
High liking/low similarity vs. low liking/high similarity	*M* =$4.63 vs. $2.18; *t*(51)=5.67, *p*<.001, *d*=0.786	Liking	Average difference 1.35 larger for other; *t*(51)=2.44, *p*=0.018, *d*=0.338
High liking/low deservingness vs. low liking/high deservingness	*M* =$2.37 vs. $2.90; *t*(62)=-1.35, *p*=.198, *d*=0.164	Neither	No difference
High liking/low need vs. Low liking/high need	*M* =$3.43 vs. $2.29; *t*(64)=1.14, *p*=.003, *d*=0.378	Liking	Average difference 3.15 larger for other; *t*(64) = 4.97, *p*<.001; *d*= 0.616
High similarity/low need vs. low similarity/high need	*M*=$2.21 vs. $3.71; *t*(55)=-3.29, *p*=.002, *d*=0.44	Need	No difference
High similarity/low deservingness vs. low similarity/high deservingness	*M*=$1.62 vs. $4.62; *t*(60)=-6.67, *p*<.001, *d*=0.85	Deservingness	No difference
High need/low deservingness vs. low need/high deservingness	*M*=$1.47 vs. $4.14; *t*(57)=-6.12, *p*<.001, *d*=0.80	Deservingness	Average difference 1.48 larger for other; *t*(57)=2.51, *p*=0.015, *d*=0.33

Table 17. Planned pairwise comparisons comparing relative strength of influence on allocations for correlated characteristics.

Additional interactions. Another possibility to be considered is that there may be interactions between characteristics, and/or higher-level interactions between target and groups of characteristics. A lasso method (Urminsky, Hansen, & Chernozhukov, 2016) was used to select additional interactions to be added to the basic regression model using the pooled Study 5 data (see Appendix C for more detail and full results). The results of this analysis revealed only an additional significant effect of the need*liking interaction (*B* = .0001, *t*(2762)=2.16, *p* =.031; see Figure 7). There was a large main effect of need such that allocations were low overall when need was low. However, as the target became needier, there was an increasingly strong relationship between liking and allocations, such that people allocated the highest dollar amounts

to those who were both needy and well-liked. This interaction occurred both for targets consisting of others as well as future selves.

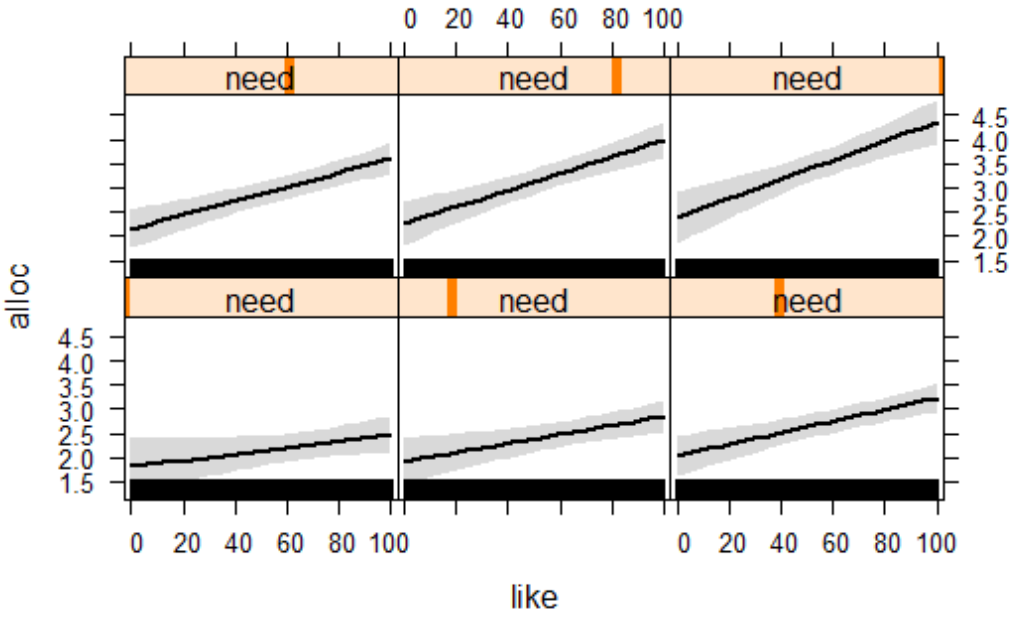


Figure 7. Interaction effect between liking and need from pooled Studies 5a and 5b.

Study 5 Discussion

Influence of characteristics for intrapersonal and interpersonal targets. Overall, the results of Studies 5a and 5b suggest that both interpersonal and intrapersonal allocations increase as each of the four target characteristics of liking, similarity, need, and deservingness increases. When using participant ratings of these factors as continuous predictors, the overall lack of target by characteristic interactions suggests that these four attributes are weighted to a similar degree in allocation decisions to others and future selves. One exception to this was that in the hypothetical allocation, the target's level of need was relatively more influential for intrapersonal allocations to future selves than for interpersonal allocations. However, the unique contribution

of this effect to allocations was in fact so small as to not be significantly different from zero (marginal R^2 = .002, 95% CI = [.000-.008]), and furthermore, the need*target interaction was not significant in the incentive compatible study. Future research might explore whether and when people may in fact attribute different levels of importance to their own future need versus another's need.

Defining the levels of each characteristic categorically by assigned condition rather than using participant-generated ratings confirmed the previous results. Nevertheless, some target by characteristic interactions (directionally consistent with results from the analysis by participant ratings), reached significance when using assigned conditions as predictors. Specifically, participants assigned to the liking or deservingness conditions allocated greater amounts to the future self than to others when liking or deservingness was low, but allocated similar amounts to the future self and others when liking or deservingness was high. Though this analysis has lower power than the analysis using continuous ratings, these additional results provide a preliminary suggestion that the tendency to favor the future self over another person may be especially pronounced in cases where the target has undesirable qualities.

Relative importance of characteristics. How does the influence of each characteristic compare with the others, and do participants' actual consideration of liking, similarity, need, and deservingness of potential recipients generally agree with people's self-reported rankings of importance? Recall that in Study 2, a different sample of participants had reported that need and deservingness would be significantly more important for them to learn about than liking or similarity prior to making an allocation decision. Studies 5a and 5b confirmed that deservingness and need were in fact more strongly related to allocations than liking and similarity, with deservingness being the strongest predictor of the ultimate allocation (with a marginal R^2 of

0.045 and 0.027 in studies 5a and 5b respectively). Need was the next most important characteristic, with a marginal R^2 of 0.024 in Study 5a and 0.013 in Study 5b. In both studies, the influence of liking and similarity on allocation, though significant, was quite small, uniquely explaining less than 1% of the variance (marginal $R^2 < .01$) in both studies.

For the basic pooled model (i.e., no interactions included), it is noted that the marginal R^2 (influence of fixed effects) is 0.228, however, the marginal R^2 of each fixed factor is much smaller (less than or equal to 0.035). This suggests that although the fixed effects as a whole explain a moderate amount of variance in allocations, each individual variable is responsible for a much smaller amount, which reflects the fact that these variables explain overlapping variance. The conditional R^2 for the model (an approximation of the variance explained by both fixed and random effects) is 0.422, suggesting that individual variation among participants explained about as much of the variance in allocations as information about the targets and their characteristics.

In Study 2, participants had additionally reported that liking and deservingness would be somewhat less important for their decisions about future selves than for their decisions about others. This intuition was supported by interactions that emerged in the analyses by assigned condition for Study 5. Here, participants reduced their allocations to a lesser extent in response to low levels of liking and deservingness when the target was a version of the future self, rather than another person. Overall, the general match between perceived importance of these characteristics in Study 2 and actual importance in Study 5 suggests that people have a good understanding of the influence of these factors on their allocation decision processes.

Heterogeneity among participants. In addition to examining the general effects of characteristics and target, we tested for heterogeneity among participants in their sensitivity to these factors. Twenty-eight out of 358 participants (7.8%) were not sensitive to the target or

manipulated characteristics at all, choosing to allocate the same amount to all eight targets (and for all but three of these participants, the amount allocated was zero, indicating that they would keep all the money for the current self). An additional twenty-six participants (7.3%) were sensitive to the target's characteristics, but were not sensitive at all to the distinction between self and other; meaning that in each case they allocated the same amount to intrapersonal and interpersonal targets that were generated in conditions with the same combination of characteristics (e.g., if a participant was generating targets that varied on liking and similarity, he or she would vary allocations based on the levels of at least one of these characteristics, but would not vary allocations based on whether the target was a version of the future self or another person). In contrast, only 4 participants (1.1%) varied allocations based on whether the target was intrapersonal or interpersonal yet did not distinguish at based on levels of the characteristics that were varied. In all of these cases, the participants allocated the maximum amount possible to the future self and none to the other person. Overall, these results suggest that the majority of participants were in fact sensitive to the effects of the characteristics examined.

Limitations. One key limitation in the interpretation of our results is that the allocation scenarios presented to participants in Study 5 were mostly hypothetical in nature (other than the possibility that one allocation would be enacted in Study 5b). Although previous literature has reported that hypothetical and real decisions do not significantly differ in similar monetary allocation tasks (Johnson & Bickel, 2002; Locey, Jones, & Rachlin, 2011), the generalizability of the current results should still be considered with caution, given the novel nature of some of our manipulations in an allocation context (e.g., imagining future selves with various levels of characteristics).

In additional to broad concerns about generalizability, further research may be necessary to identify possible boundary conditions for our conclusions about the relative influence of the characteristics examined. Specifically, we found that need and deservingness seem to exert a larger influence than liking and similarity. However, there may be contexts in which the influence of liking or similarity does in fact become primary, for example, if information about need and deservingness is not given or explicitly considered. This possibility is supported by the fact that when only participants in the "liking/similarity" condition are considered (i.e., where neither need nor deservingness were manipulated), we find a significant effect of liking on allocations (B=0.029, $t(187) = 2.675$, $p = .008$) but no effect of need or deservingness. This finding may be due the fact that participants were not considering need and deservingness when making allocations, and/or that need and deservingness fell within a smaller range in cases where they were not specifically manipulated, thus not providing very much distinction between targets. These are both situations which may arise in a real world allocation context, therefore, further exploration of when various factors may exert a different degree of influence is warranted.

GENERAL DISCUSSION

The studies in this paper have taken a step towards bridging research on interpersonal and intrapersonal allocations by examining, within a single paradigm, whether, and to what degree, people focus on the same factors when deciding whether to make current sacrifices to benefit another individual or the future self. Although characteristics such as liking, similarity, need, and deservingness had been highlighted in previous literature as playing a role in such allocation decisions, most work to date had focused on only one of these characteristics at a time. Furthermore, while previous empirical research has suggested that thinking about the future self

from a less connected, more "other-like" perspective may affect choices made for the future self (Bartels & Urminsky, 2011; Ersner-Hershfield, Wimmer, et al., 2009; Pronin et al., 2008), the influence of target-related characteristics on intrapersonal and interpersonal allocations had not been directly compared. The current research addressed the question of whether the future self is really treated in the same way as a third party would be by systematically examining the effect of these characteristics on monetary allocations to both types of recipients.

Parallels Between Future Selves and Others

The current research found that in some ways, people do seem to treat future selves in very much the same way that they treat others. When asked to think about either interpersonal or intrapersonal allocations, people reported factors related to need, deservingness, liking, and similarity as influential in their decisions (Studies 1 and 2), and these factors do in fact seem to be similarly influential for both types of targets (Studies 5a and 5b). Perhaps unsurprisingly, people seem to use their perception of whether the target deserves money as the primary factor in deciding how much to allocate. Based on participant responses in Studies 1c-1f, people seem to determine deservingness by assessing work the target has done (or is willing to do) to earn money, or alternately, by whether the planned use of the money is deemed to be worthy. Both self-reported importance of characteristics (Study 2) and the relationship between these characteristics and actual allocations (Study 5) revealed that deservingness and need are most influential, whereas liking and similarity have weaker, though still significant, unique influence on allocations.

The pattern of influence of these characteristics is in fact quite similar between targets that are future selves and targets that are others. Overall, increases in all four characteristics of need, deservingness, liking, and similarity consistently increase allocations, regardless of the

type of target. The fact that people are similarly responsive to changes in these characteristics for both the self and other suggests that interventions related to these factors used for one type of recipient can also be equally effective for another. For example, one large body of research explores the mechanism underlying empathy for others, as well as methods for promoting empathy to increase helping behavior (e.g., Batson, Fultz & Schoenrade, 1987; Batson et al., 1997; Batson et al., 2003; Campbell, O'Brien, Van Boven, Schwarz, & Ubel, 2014; Decety, 2005; Gutsell & Inzlicht, 2012; Hein et al., 2010; Lamm, Batson, & Decety, 2007; O'Brien & Ellsworth, 2012). Given our findings, some of the methods used to increase empathy for others that are related to the characteristics we examined (e.g., highlighting need or similarity) could similarly be used to increase empathy and helpful behaviors towards future selves.

Distinctions Between Future Selves and Others

Despite the finding that changes in the characteristics of liking, similarity, need, and deservingness seem to have a similar impact on resource allocations to others and to future selves, we nevertheless found a strong "premium" in future self allocations that cannot be ignored. Even when all four characteristics were controlled for in our regression models, there was still a quite large unexplained difference whereby more money was allocated to the future self (approximately 65 cents in Study 5a and 95 cents in Study 5b). It appears that although future selves may be treated like others in the degree to which they are affected by changes in need, liking, similarity, and deservingness, future selves are *not* treated like others when it comes to the absolute amount allocated to them. Instead, the future self starts at an advantage, having more allocated to him or her by default. Although the current research was intended as a careful examination of whether future selves are treated in the same way as others, it was beyond its scope to determine the underlying reason for any such differences. However, given that a

systematic difference was found, the reason why it exists remains an important open question. Three possible explanations for this difference are thus briefly discussed below.

One possibility is that people inherently have a higher baseline degree of positive feelings towards the future self which was not captured by the current measures. Although participants in our study did not rate future selves as being significantly more well-liked on average than others, it is possible that they may have used the scale differently for these two types of targets. For example, if participants interpreted the meaning of the endpoint of "strongly dislike" less extremely when thinking about a future self than about another person, this could have produced a pattern similar to the observed findings. In this case, a future self would in fact be more liked than another person who appears to share their same rating scale value. Although we attempted to reduce this possibility by having participants rate future selves and others on the same screen and stressing that they should use the same rating scale, future studies could verify this outcome with additional methods of measuring or manipulating perceptions of target characteristics, such as implicit measures or more detailed titration procedures to equate future selves and others.

Assuming the results were not affected by differences in scale usage, we also present several theoretical reasons for the observed difference. First, some may think it obvious that the future self would never be treated exactly as another person would be, and would consider further explanation of this fact to be unnecessary or perhaps even impossible. Proponents of this view would claim that, although there may be some common criteria that people apply to judge both future selves and others, the self is fundamentally different from the other on some irreducible level, and that any comparison between the future self and another person would only be useful as a rough analogy. According to this type of view, a person's own identity is defined as a separate concept that is maintained separately from and cannot be reduced to any of the

specific factors of one's existence, such as the brain or body, or the mental events contained therein (e.g., see Shoemaker, 2002). Similarly, Perry (1979) argues that the indexical expression "I" holds an essential self-referential meaning which cannot logically be replaced by any other way of describing the person to which it refers. If people hold this type of non-reductionist concept of themselves, they might thus ascribe a special importance to the mere idea of the "self," regardless of any specific changes it may have undergone over time or the details of the qualities it may possess. This preferential view of the self might then sustain a consistent difference in allocations, with larger allocations being made to the self.

Another possibility is that though people might not view the future self as irreducibly different from all others, their allocation behavior is nonetheless influenced by an inherent sense of responsibility for the future self that they do not necessarily feel for all others. Just as one might feel an inherent motivation to better the condition of one's children by virtue of the family relation (rather than because of specific personal characteristics such as those measured in the current studies), one might feel a similar motivation to better the condition of the future self (Bryan & Hershfield, 2012; Whiting, 1986). In this sense, the future self may be treated not like just any other person, but may specifically be treated like a close other (family, friend, or loved one). In the current studies, we did not specify the social role of the others named by our participants; thus, these targets were likely to be a mix of close others and more distant acquaintances. It is therefore possible that greater allocations to the future self were observed on average because all future selves were treated similarly to close others, whereas only a portion of the third-party targets were in fact close others. Although results of Study 3 suggested that at least some of the variation due to social role was likely to have been captured by our measures of liking and deservingness, future research in this area can examine this intriguing possibility by

specifically comparing allocations to the future self with allocations to others with varying social roles and degrees of social connection.

A third possibility is that the future self is treated differently from others because of the fact that people are likely to hold richly elaborated mental schemas that link the current and future self within a larger self-concept. Previous research suggests that the self-concept is temporally extended and incorporates the possibility of causally consistent change over time (Rips, Blok, & Newman, 2006; Sider, 1996; 1997). Thus, even as one acknowledges that the future self will be different from the current self, expectations of and desires for personal development are often central to current identity, and some aspects of current identity are causally central to one's future identity (Chen, Urminsky, & Bartels, 2016; Molouki & Bartels, 2017; Peetz & Wilson, 2008). In the current studies, each participant was likely to perceive some versions of the future self to be more congruent with his or her self-concept than others, and we suspect that this in turn had an effect on allocations. However, at a broader level than these individual variations, it is possible that the general propensity to mentally link current and future selves via causal theories of identity and change led to an overarching tendency to allocate more to future selves than to others. The idea that people generally do hold a firm association between their current and future self is underscored by empirical findings that people generally tend to report a relatively high degree of connectedness (i.e., self-perceived overlap and similarity) between the current and future self (e.g., Bartels & Urminsky, 2011; Molouki, Bartels, & Urminsky, 2017).

Conclusion

The current research is novel in that it specifically demonstrates that a target's identity as self or other influences allocation behavior even when controlling for the most important target

characteristics of need, deservingness, liking, and similarity. Previous research has highlighted that people may think of their own diachronic identity on a continuum (e.g., Bartels & Rips, 2010; Ersner-Hershfield, Garton, et al., 2009; Heiphetz, Strohminger, & Young, 2017; Molouki & Bartels, 2017; O'Brien & Kardas, 2016), and the current results support this possibility. In other words, though the future self is treated differently from the current self (i.e., in our experiments, people consistently chose to keep more for the current self than they allocated to the future self), the future self is also not completely treated as a third party is. Rather than simply describing the future self as "another person," further research in this domain can more specifically examine how the continuum of concern for future self is similar to or different from the continuum of concern for others who vary both in personal characteristics and social roles. This research underscores the fact that issues related to the nature of identity are not just a purely philosophical concern, but can also have important consequences on real-world allocation decisions and behavior. These questions should thus be considered carefully when exploring the causes of these decisions, as well as in any attempts to influence them.

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Appendix A: Additional Stimulus Information

Prompt for Study 1a:

"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], 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 Study 1b:

"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."

Prompts used to elicit target recipients in Studies 3-5:

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.

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…

<u>Need/Deservingness Condition</u>

[**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…

Appendix B: Full Results for Analysis by Assigned Condition (Study 5)

Study 5 Pooled Regression Model 1: Fixed Effects					
	Estimate	*Std. Error*	*Df*	*t value*	*p value*
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 B.1. Fixed effects from Model 1 using assigned conditions as predictors, pooled across Studies 5a and 5b.

Study 5 Pooled Regression Model 1: Marginal R^2 Values			
Effect	R^2	*Upper CL*	*Lower CL*
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 B.2. Marginal R^2 values (effect size measures) for model and individual effects from Study 5a and 5b pooled Model 1.

Study 5 Pooled Regression Model 2: Fixed Effects					
	Estimate	*Std. Error*	*Df*	*t value*	*p value*
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 B.3. Fixed effects from Model 2 using assigned conditions as predictors, pooled across Studies 5a and 5b.

Study 5 Pooled Regression Model 2: Marginal R^2 Values			
Effect	*R^2*	*Upper CL*	*Lower CL*
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 B.4. Marginal R^2 values (effect size measures) for model and individual effects from Study 5a and 5b pooled Model 2.

Appendix C: Lasso Regression Model for Testing Additional Interactions

Methods provided in Urminsky, Hansen, & Chernozhukov (2017) were used to select a subset of variables from among all two-way interactions between characteristics, all two-way interactions between target and each characteristic, and all three-way interactions between each pair of characteristics and target. From this method, a total of six interactions were selected and added to the basic model (i.e., main effects of target and each characteristic). These interactions and the full results of the subsequent model are listed in the table below.

Study 5 Pooled Regression Model after Lasso Variable Selection					
	Estimate	*Std. Error*	*Df*	*t value*	*p value*
Intercept	2.528	.133	837	18.95	<.001
Target (0=other, 1=self)	.729	.114	2500	6.38	<.001
Liking	.0136	.0027	2753	5.10	<.001
Similarity	.0091	.0029	2697	3.14	.002
Need	.0135	.0017	2720	8.15	<.001
Deservingness	.0273	.0026	2745	10.54	<.001
Target*Similarity	-.0025	.0033	2645	-0.76	.450
Liking*Need	.0001	.00006	2762	2.16	.031
Liking*Deservingness	.0001	.00006	2806	1.74	.082
Similarity*Deservingness	.00004	.00006	2782	0.64	.520
Need*Deservingness	.00007	.00007	2782	1.00	.319
Target*Need*Deservingness	.0001	.00008	2603	1.40	.163

Table C.1. Results of model after lasso variable selection for testing of all two- and three-way interactions between characteristics and target.