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Sharing with a stranger: people are more generous with time than money

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ABSTRACT

With the present study, we tested whether generosity changes dependent on money or time being shared. During the experiment, participants $N = 371$ ($M_{Age} = 37.5$ years, 38.8% female) completed questionnaires measuring social value orientation, moral identity centrality, and honesty-humility. The opportunity cost of time spent on a real effort task was measured with an incentivized method. Then, participants played two versions of a dictator game: either in a standard dictator game, where participants could share payoffs from the real effort task; or in a time dictator game, where participants decided how long they want to work for another participant's payoff. We tested three hypotheses. (a) Time and money are not equivalent, and participants are more generous with time than with money. (b) Giving time results in higher positive affect than giving money. (c) Participants' social value orientation, moral identity centrality, and honesty-humility explain the difference between the donations of time and money, and personality traits will have a stronger impact on time decisions than on monetary decisions. We found that approximately 50% of participants were more generous when giving time, this effect was not dependent on the opportunity cost of time. We think that our experiment is the first experiment to unambiguously show this effect. Furthermore, generosity was not related to positive affect and we found no moderating effect of personality traits.

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Social preferences; social value orientation; allocation decisions; time is money; interpersonal choice; individual differences

We make many decisions every day on how to allocate our resources. For example, how long do I listen to a stranger's problems on the bus? How much money do I give to a person in need? Both situations elicit a decision about the allocation of my resources, but in the first situation, my decision is about time, and in the second, my decision is about money. Are decisions about time and money equivalent? Human capital theory (G. S. Becker, 1965) and even Benjamin Franklin proposed that "time is money" (Franklin, 1820, p. 1). However, empirical evidence has shown that, on a psychological level, time and money are not the same.

Whereas the context drives the values of money and time (Leclerc et al., 1995), mentally keeping track of gains and losses (i.e., mental accounting) is easier to do for money than for time. This explains why sunk costs influence decisions about money but not decisions

about time (Soman, 2001). The difficulty of mentally accounting for time is due to the fact that time is more ambiguous than money: whereas money is processed analytically, time is processed intuitively (Leonard et al., 2015; Saini & Monga, 2008).

Experiments investigating decisions about money and time have generally found that people share time and money (Brown et al., 2019; Ellingsen & Johannesson, 2009; Lilley & Slonim, 2014) and one study suggests that people are more generous with time than money (Davis et al., 2015). When giving time and money, two differences in previous research are apparent. First, participants shared their already obtained endowment, or gave anticipated or future time. Second, participants either shared windfall money, or shared their own working time. So in these studies not only the resource shared varied but also other variables associated with each resource, like timing or the way how the resource was obtained. To avoid confounding variables it is necessary to use the same task to obtain both resources and the same sequential order of choice and effort necessary to obtain it when comparing the two resources, which has been done by Davis et al. (2015). Davis et al. (2015) conducted a study that is similar to ours, but in Davis' study, participants received time and money by windfall, and opportunity costs were not assessed ahead of time but were measured in relation to time after the experiment. Additional waiting time after the experiment is likely to be mentally accounted in a different way than time that has already been allocated to the experiment. Thus, in this approach the value of time given to the recipient in a dictator game during the experiment is unknown.

Furthermore, previous research besides Davis et al. (2015) did not conduct within person comparisons – people who are very generous with one resource (e.g., money) may not necessarily very generous with the other (e.g., time) – as the rank order of generosity is not stable across both resources (Bekkers, 2010; Davis et al., 2015). To summarize, it is still unclear if consistency or inconsistency of choice is related to opportunity costs of time or to individual differences. Furthermore, generosity for time in previous research may have been inflated if time had already been allocated to be spent on the experiment and thus may have been considered cheap to give away.

To rigorously test the effect of time or money on generosity and rule out other factors that differ between time and money, we used the same task and sequence of choice for both resources. Additionally, decisions about personal time and personal money in a real effort task and opportunity costs were assessed before the decision about sharing was made. Furthermore, by also assessing affect we tested whether giving time is more likely to elicit a warm glow (i.e. positive affect). Lastly, we hypothesized that certain personality traits can explain why people differ in how much time or money they are willing to give to others. We present a registered report that provides a clear test of these hypotheses.

Interdependent decisions and prosocial behavior

Decisions regarding the allocation of resources that have consequences for the decision-maker and at least one other person represent a specific case of interpersonal decisions (Bazerman et al., 1995; Choshen-Hillel & Yaniv, 2011; Loewenstein et al., 1989; Trautmann & Vieider, 2012). Such allocation decisions depend on a person's preferences regarding

their payoffs and social preferences (Kahneman et al., 1986). Social preferences “refer to how people rank different allocations of material payoffs to themselves and others” (Fehr & Camerer, 2004, p. 55) and, as a result, reflect motives such as altruism, fairness, envy, or self-interest.

Social preferences are affected by whether the consequences of the decision are interdependent or non-interdependent (Forsythe et al., 1994). Interdependent decisions are decisions for which the consequences of the decision for the decider and the other affected party are determined jointly. As a result, the behavior of the decider is conditional on the decider’s beliefs about the reactions of the other party. For example, the amount offered to another person in a bargaining situation depends on the decider’s beliefs about whether the other will accept the offer or not.

A typical measure of social preferences in interdependent situations is the ultimatum game (Güth et al., 1982). In the ultimatum game, a proposer decides how to split an endowment between him- or herself and another anonymous recipient, the responder. The responder has to decide whether to accept the proposed split or not. If the split is accepted, both parties receive their respective payoff. If the split is rejected, neither receives anything. Thus, the proposer’s offer depends on their beliefs about the responder’s aversion to inequality. The mode choice is a 50:50 split, which can reflect a preference for (a) fairness due to strategic concerns about the likelihood that the offer will be rejected or (b) fairness due to altruism (Camerer, 2003; Van ‘Twiout & Leder, 2018).

Non-interdependent interpersonal decisions are decisions for which the outcomes of the other party depend only on the decision-maker’s choices. In other words, the affected party is powerless, and the behavior of the decision-maker is unconditional. To measure unconditional social preferences, in particular altruism, the dictator game is used. In the dictator game, one participant, the so-called dictator, decides how to allocate a given endowment between him- or herself and an anonymous recipient (Engel, 2011; Leder & Schütz, 2018). Across studies, approximately 36% of participants keep everything for themselves, 34% gave more than 0 but less than a 50:50 split, 17% of participants split the given endowment 50:50, 13% give more than 50% of the whole endowment to the recipient (Camerer, 2003; Engel, 2011). Apparently, people are less generous in non-interdependent decisions, where there is no expectation of reciprocity. In these decisions, the choice presents a measure of a person’s prosociality, that is, the willingness to give away one’s own resources (e.g., money, time, effort) to help others (Penner et al., 2004).

Experiments examining prosocial behavior utilize money or time as resources in interpersonal decisions. Experiments utilizing paradigms rooted in behavioral economics mostly use monetary allocation decisions when investigating prosocial behavior (Baumert et al., 2014; Ferguson et al., 2019; Gächter, 2007; Leder & Betsch, 2016; Zhao & Smillie, 2015). Experiments in the tradition of social psychology often use helping behavior, which presents a decision about how to allocate time (e.g. Batson et al., 1988; Fessler, 2009; Mogliner et al., 2012; Piliavin & Hong-Wen, 1990). The question, if the resources themselves influence interpersonal decision-making and prosocial behavior has received only limited research attention. Before reviewing the body of research that has examined the effect of the type of resource on interpersonal decisions, we will describe general differences between time and money.

Differences between time and money in consumer decision-making

Keeping track of losses and gains in different situations is referred to as mental accounting (Thaler & Johnson, 1990). Because the value of time is more ambiguous, and valuation in retrospect is difficult (Soman, 2001), mentally accounting for time is more difficult than mentally accounting for money. Mental accounting is used to explain the sunk cost effect, which describes the phenomenon that people keep investing after losses to avoid having invested in vain (i.e., they honor past losses in their decisions, Zeckhauser et al., 1991), but this effect is usually not observed in decisions about time. However, after adding a monetary measure (e.g., hourly wage) to a time-investment task, the sunk cost effect also tends to occur in decisions about time (Soman, 2001). Besides, people tend to underestimate the time they need for holiday shopping, but they can accurately estimate the same shopping spree's expenses (Spiller & Lynch, 2009).

The value of time and money are both context-dependent, which means the valuation is affected by reference points (Leclerc et al., 1995), but the value of time is more flexible than the value of money. The variation in satisfaction between losing or winning money is greater than the variation in satisfaction after winning or losing time of equal value (Leclerc et al., 1995; Okada & Hoch, 2004). This is interpreted as an indicator that the value of time can more easily be accommodated to outcomes (e.g., the value of time decreases less after losses) than the value of money. This interpretation suggests that the value of time is more ambiguous than the value of money (Okada & Hoch, 2004).

Based on the observation of such differences, it has been argued that the value of time is processed intuitively, whereas money relies on analytical information processing (Leonard et al., 2015; Saini & Monga, 2008). The mode of information processing affects interpersonal behavior, that is, intuitive information processing results in more prosocial decisions than analytical information processing (Dickert et al., 2011; Rand et al., 2012; Zaki & Mitchell, 2013). From this follows the idea that people might behave more prosocially when making decisions about time than when making decisions about money.

Time and money as resources in prosocial behavior

Thinking about money results in decreased helpfulness and increased distancing from others (Vohs et al., 2008), which perhaps explains why translating time into money via hourly pay reduces volunteering (DeVoe & Pfeffer, 2007). When time was used as the resource in an ultimatum game, the majority of proposals were 50:50, and behavior was identical to ultimatum games reported in the literature using money (Berger et al., 2012). Using time instead of money in a dictator game by asking participants to perform a real effort task that benefitted an anonymous recipient, a study found that participants were willing to work on a tedious task (give time) when their work benefitted an anonymous recipient, and the opportunity costs of time were negatively correlated with donations (Danilov & Vogelsang, 2015). However, there are two reasons why results of both studies are inconclusive with respect to the question of whether generosity differs between time and money. First, ultimatum game behavior (Berger et al., 2012) is not a measure of generosity but rather conditional cooperation, and second, whereas it was found that participants were generous about giving their time in a dictator game (Danilov & Vogelsang, 2015),

participants' level of generosity was not compared with a money condition in the same study.

Intentions to give time and money to charity yielded a low correlation ($r = .24$, Bekkers, 2010), and even when the opportunity costs of time were controlled for, people were more generous in decisions about giving time in comparison with those about giving money (Brown et al., 2019; Davis et al., 2015; Ellingsen & Johannesson, 2009; Lilley & Slonim, 2014).

In a real effort task, participants had to adjust sliders in a computerized task and were paid according to the time they spent working (Brown et al., 2019). Three conditions were compared: (a) a *money and time condition*, in which participants worked for their payoffs or charity and could also donate money at the end of the task; (b) a *time only condition*, in which participants could work on the task for charity or their payoff; and (c) a *money condition*, in which participants worked only for their payoff and could donate a sum of money at the end of the experiment. Participants' average final donations were higher in the two conditions where decisions were made about time than in the money condition because participants were working more for charity than for themselves. Furthermore, participants preferred to give time even when the wage structure suggested that working for themselves and donating later would be more efficient. Importantly, this study focused on giving to charity not on generosity towards another participant, and choices were compared between, but not within participants.

However, this tendency to be more generous with time than with money was observed not only in decisions regarding charities (Brown et al., 2019; Lilley & Slonim, 2014) but also in interpersonal decisions (Davis et al., 2015; Ellingsen & Johannesson, 2009). When participants made decisions about time or monetary payoffs for themselves and others, it was found that a substantial proportion of participants were more generous about their time decisions than their monetary decisions (Davis et al., 2015; Ellingsen & Johannesson, 2009). In the latter study, participants made a decision about waiting after the experiment to gain a monetary payoff, which was used as the endowment in an ultimatum game in the experiment (Ellingsen & Johannesson, 2009). The decision in the ultimatum game is only indirectly about time and waiting time after the experiment might be discounted, because it is a future price to pay (Frederick et al., 2002). Davis et al. (2015) asked participants to immerse one of their hands in cold water for a short period of time (Experiment 1) or to decide how long to work for an anonymous recipient in a previously allotted time slot of 30 minutes (Experiment 2). In the case of Experiment 1 the time expenditure for the other is short and results in a relatively high payoff for the other participant and in Experiment 2, the time had already been planned to be spent in the experiment and was not personal time. Moreover, the money was obtained by windfall and opportunity costs were measured in relation to time after the experiment, not time during the experiment.

We aim to test whether generosity in giving time, as observed in decisions regarding charity, will also be observed in interpersonal decisions when the time and money given require tedious work and the decision is about time for which opportunity costs have been obtained. By doing so, decisions about time and money will be directly comparable.

Prosocial behavior can be motivated by the desire to increase the welfare of another (i.e. pure altruism, Batson et al., 1995) or by the desire to feel good about oneself (i.e., impure altruism, Baumann et al., 1981). Behavior guided by impure altruism is motivated

by self-interest, such as the induction of positive feelings and happiness (Alden & Trew, 2013; Dunn et al., 2008, 2014). Thus, giving has a hedonistic value for the giver, and improving the welfare of the other can be a means rather than an end (Andreoni, 1990; Konow & Earley, 2008). Even when individual contributions do not increase the joint welfare of all individuals, contributions to the public good are explained by impure altruism, or the so-called warm glow of giving (Andreoni, 1990). It is argued that giving time helps people feel better (induces a warm glow) and as such is individually more valuable than giving an equal amount of money (Brown et al., 2019; Davis et al., 2015; Reed et al., 2015).

Because the value of time is adjusted to the context to a greater degree than is the case with money, time and money may differ as resources to be given. For example, 10 minutes of waiting are valued differently than 10 minutes reading the news (Festjens et al., 2015; Leclerc et al., 1995). Thus, giving time to others might render time more valuable and might result in greater satisfaction than using the same amount of time for oneself. Lilley and Slonim (2014) identified a smaller effect of donation matching when time was involved. It seems people are more willing to give time than money because this helps them feel good. *We thus propose that individuals are more generous when giving time than when giving money and experience more positive affects when giving time than when giving money.* Furthermore, as elaborated above, the increase in generosity does not seem to be universal but is rather driven by a subset of individuals. We propose that interindividual differences explain differences between decisions about time and money.

Interindividual differences relevant for interdependent decisions: social value orientation, honesty-humility, and moral identity centrality

In interpersonal decisions such as the ones described above, self-interest (i.e. maximizing personal payoff) and altruism (e.g., maximizing others' payoffs) are in conflict. Seminal work (Messick & McClintock, 1968) proposed that three social motives guide interpersonal decisions: (a) *cooperation*, a social motive satisfied by maximizing joint payoffs, (b) *competition*, a social motive satisfied by maximizing the difference between one's own personal payoff and another person's, and (c) *individualism*, a social motive satisfied by maximizing personal payoffs with no regard to the other person. These social motives are captured by an individual's social value orientation (Van Lange et al., 1997). Social value orientation captures the weight individuals assign to consequences for themselves and others in interpersonal decisions (Van Lange et al., 1997).

Social value orientation is linked to more basic traits (Hilbig et al., 2014), in particular to one facet from the HEXACO personality model (Ashton & Lee, 2007): honesty and humility (Baumert et al., 2014; Hilbig et al., 2014; Hilbig & Zettler, 2009; Zhao & Smillie, 2015). Honesty-humility represents one dimension in the HEXACO personality model that reflects an individual's tendency to be fair and honest toward another individual even when no sanctioning is possible (Ashton & Lee, 2007).

Moral identity represents a self-schema that reflects how an individual connects him- or herself to others. Moral identity contains traits that come to mind when individuals describe how they act in their relationships with others, for example, being cooperative and forgiving (Aquino & Reed, 2002; Reed & Aquino, 2003). It has

been shown that the influence of moral identity on behavior depends on situational cues (Aquino et al., 2009) and the chronic availability of moral identity which is referred to as moral identity centrality (Aquino & Reed, 2002; Narvaez et al., 2006; Reynolds & Ceranic, 2007).

These three interindividual differences are assumed to reflect aspects of the prosocial personality (Baumert et al., 2014; Hilbig et al., 2014), and we propose that decisions about time can be explained to a greater degree by these three interindividual differences than decisions about money.

Interindividual differences and time and money donations

Social value orientation has been found to be correlated with donations to charity in some studies (Bekkers, 2007a; Van Lange et al., 2007) but not in others (Baumert et al., 2014). It has also been correlated with giving money in dictator games (Hilbig et al., 2014; Hilbig & Zettler, 2009). When volunteering and donations were assessed together, a prosocial value orientation predicted volunteering but not donations (Bekkers, 2010). Across studies, social value orientation has been found to be correlated with actual volunteering (Batson et al., 2007; McClintock & Allison, 1989; Van Lange et al., 2011), self-reported past volunteering (Bekkers, 2007b), and intentions to volunteer (Bekkers, 2010). Taken together, social value orientation's link with monetary donations seems weaker than its link with donating time by volunteering.

Honesty-humility has been shown to be a source of prosocial behavior across a multitude of situations (Ashton & Lee, 2007; Hilbig et al., 2014; Zhao & Smillie, 2015), and like social value orientation, it has been found to be positively related to giving money in dictator games (Baumert et al., 2014; Hilbig et al., 2015; Hilbig & Zettler, 2009). However, whether or not honesty-humility is related to giving time in interpersonal decisions is still an open question.

Moral identity centrality has been found to be positively associated with volunteering (Fagin-Jones & Midlarsky, 2007; Frimer et al., 2011; Matsuba & Walker, 2004, 2005), which can be explained to some extent by the observation that individuals for whom moral identity is central tend to experience moral behavior as more elevating than individuals with low moral identity centrality (Aquino et al., 2011). Moreover, intentions to donate time tend to be more strongly affected by personal norms and identity than intentions to give money (L. Lee et al., 1999). Furthermore, when moral identity centrality is high, the opportunity costs of time have been found to be positively correlated with the giving of time, which shows that particularly costly helping is experienced as positive and rewarding by these individuals, which is why they would rather give time than money (Reed et al., 2015). However, studies have yet to test whether the effect of moral identity centrality on prosocial behavior is moderated by the resource that is being exchanged.

Apparently, interindividual differences in social value orientation (Messick & McClintock, 1968) and moral identity centrality (Reed & Aquino, 2003) influence the different valuations of time and money as gifts. The preference for time over money as a gift is moderated by moral identity centrality (Reed et al., 2015), and higher moral identity centrality preserves the willingness to give time even if opportunity costs increase (L. Lee et al., 1999; Reed et al., 2015). Social value orientation has consistently been found

to be correlated with self-reported past volunteering (Baumert et al., 2014; Bekkers, 2007b; McClintock & Allison, 1989), but in another study, prosocial value orientation was predictive of only the intention to give time, not money (Bekkers, 2010). Although it has been observed in some studies that social value orientation is correlated with self-reported donations (Van Lange et al., 2007) as well as actual donations (Bekkers, 2007a), such findings were not observed in another study (Baumert et al., 2014). Apparently, the relation between social value orientation and giving time is clearer/stronger than between social value orientation and giving money.

Time is a very personal resource (Foa & Foa, 2012) that is particularly tied to an individual's identity (Reed et al., 2015). Thus, we propose *the type of resource moderates the effects of social value orientation, honesty-humility, and moral identity centrality on interpersonal allocation decisions*. We expect that interindividual differences in prosociality will be better predictors of time decisions than they will be of monetary decisions. From this prediction also follows the idea that inconsistency between time and money decisions should be explained by interindividual differences in social value orientation and moral identity centrality because individuals with prosocial personality traits derive more pleasure from giving time than from giving money, and this difference should attenuate differences between individuals' choices.

The present study

In the present study, we compared interpersonal decisions about time and money in the same individual. Whereas previous studies have focused on giving money or time to charity (Brown et al., 2019; Lilley & Slonim, 2014) and the tasks that participants were asked to fulfill differed, we used very parallel procedures. By using the same tedious task to give money and to give time in the dictator game, the experiment allowed us to rule out the possibility that different ways to gain time and money could result in different decisions (Davis et al., 2015; Ellingsen & Johannesson, 2009). Furthermore, we assessed individual differences to test whether the inconsistencies between decisions involving money and time are dependent on the decision-makers' characteristics.

All participants of an online study first completed a survey for assessing social value orientation (Murphy et al., 2011), honesty-humility (K. Lee & Ashton, 2018), and moral identity centrality (Aquino & Reed, 2002). Then, participants had to decide how much time and money to give to an anonymous person (as in the standard dictator game). The time, as well as the money that people could give, was generated in a real effort task, and the decisions about giving time and money were made before the task to rule out the effects of the task on decision-making. To compare participants' time costs, opportunity costs were measured with an incentivized method. At the end of the real effort task, the PANAS (Watson et al., 1988) was used to measure the affect associated with giving time or giving money.

We tested three hypotheses. (a) In decisions about giving time to another person, people are more generous than when giving money (Hypothesis 1). (b) Giving time results in a higher positive affect than giving money (Hypothesis 2). (c) The difference between the two types of decisions is explained by interindividual differences (Hypothesis 3a).

Aspects of a prosocial personality have a stronger impact on decisions about giving time than giving money (Hypothesis 3b).

Method

Design

The study was carried out as an online study. Participants were recruited by the Leibniz Institute for Psychology Information (ZPID) via MTurk. Participants received 5 USD compensation for participation and an additional bonus from the real effort task. Participants completed questionnaires for assessing social value orientation (Murphy et al., 2011), honesty-humility (K. Lee & Ashton, 2018), and moral identity centrality (Aquino & Reed, 2002). Participants made two decisions: one decision about time and one decision about money. The order of the two decisions was counterbalanced across participants. Participants were told that a virtual coin toss determined which one of their decisions would be carried out. The within-subject design allowed us to test the consistency of social preferences in decisions about time and money.

Sample size

We used GPower (Faul et al., 2007) to estimate the necessary sample size. We estimated the power of our study for the hypothesis that personality moderates the effect of resource type by computing a z-test to compare the inequality of two dependent Pearson r s.¹ We aimed for a power of 0.8 and an alpha of .01 to correct for the effect of multiple tests. Because we only found studies that had published results for social value orientation and time as well as monetary decisions, we used these correlations as estimates of the effect size in question. We expected the correlation between giving time and giving money to be around $r = .2$ (based on Bekkers, 2010), the correlation between time and a personality variable to be around $r = .4$ (based on McClintock & Allison, 1989), and the correlation between a personality variable and money to be around $r = .2$ (based on Baumert et al., 2014). To detect this difference between both correlation coefficients, we aimed for a sample of $N = 361$ and the final sample was $N = 371$ ($M_{\text{Age}} = 37.5$ years, 38.8% female). This sample provides sufficient power ($> .80$) for testing Hypotheses 1 and 2. The power analysis protocols can be found in Appendix A.

Materials and measures

Real effort task

In the real effort task, participants viewed 10 sliders per page and had to adjust them to a value that was randomly determined. Participants had 30s per page to adjust all the sliders after the 30s elapsed the page reloaded and for the 10 sliders new random values were shown to which the sliders had to be adjusted. If the participant did not adjust all the sliders, no working time was accumulated, and the time spent on that page was not deducted from the final working time. Participants were alerted if they had not adjusted



Figure 1. Screenshot as an example of two sliders used in the real effort task. Sliders are adjusted by clicking on them and then moving the cursor to the specified position and clicking on it.

all sliders after 25 seconds had passed. An example of the sliders used is shown in Figure 1.

In the monetary tasks, the task ended after 15 minutes. In the time tasks, the end of the task depended on the participant's decision.

The opportunity cost of time

As in other studies that had compared money and time (Ellingsen & Johannesson, 2009; Lilley & Slonim, 2014), we used a Becker-DeGroot-Marschak auction to elicit the wage that participants wanted to receive for a real effort task (G. M. Becker et al., 1964). This reflected participants' opportunity cost of time. Participants were asked to state the amount of money that they request for performing the real effort task for 15 min. Participants were told that their requested wage will be compared with a random number drawn from a distribution of offers for the same task. If their requested wage was smaller or equal to the randomly chosen number, the participants worked on the task for the agreed-upon wage presented by the random number. If their requested wage was larger than the random number, the experiment ended.

Decision-making task

In the decision-making task, there were two roles: the decider and the recipient. Participants played both roles: First, they were a decider and later a recipient, but they were not told in advance that they will switch roles. Participants were informed about the existence of both roles and were assigned the role of a decider before they made their decision about giving money and time. Participants made two decisions which were presented in a counterbalanced order: one decision about how to split the money between themselves and a recipient (i.e., the money treatment) and one decision about how long to work on the task to help a recipient shorten their working time (i.e. the time treatment). Participants were told that only one of their decisions would be randomly selected and played out. Deciders and recipients were then matched on the basis of the following procedure: Deciders whose time decision was selected received an additional payoff at the end of the experiment in the role of the recipient from a decider for whom the money decision was selected. Deciders whose money decision was selected (i.e.,] deciders who will have to work for 15 min) ended their task early based on a matched decider's allocation in the time treatment.

Money treatment

In the money treatment, participants stated how much of their earnings they would give to another randomly matched participant in the other group. Once the decision was



Figure 2. Screenshot showing the measure of the split of the earnings from the real effort task for an individual whose requested final payoff is 5.00€.

made it could not be changed and was carried out after the real effort task was completed. The decision was measured on an 11-point scale, and the steps resulted in splitting their requested payoff into 11 discrete payoff distributions (see [Figure 2](#) for an example).

Time treatment

In the time treatment, participants decided how long they would work to benefit another anonymous participant in the other group. The decision determined the duration of the real effort task for them, and the longer they worked, the less another randomly matched anonymous participant had to work to finish their task and receive a payoff. Participants were told that they had to decide how long they want to work on a task, and could choose a point on an 11-point scale where the minimum is working 0 min and the maximum is working 15 min. By dividing 15 min into 11 equidistant intervals, the steps are 1 min 30 s (see [Figure 3](#)).

Social value orientation

Social value orientation (SVO) reflects the individual valuation of outcomes for other people as well as the valuation of relative payoff differences. SVO was measured with the 6-item version of the SVO slider measure (Murphy et al., 2011). Participants were asked to indicate their preferences for the hypothetical distribution of money *between* themselves and another person in a set of non-constant-sum dictator games. High values of SVO after scoring the slider measure indicate a high social value orientation (i.e. high prosociality).

Honesty-Humility

The honesty-humility dimension of the HEXACO model reflects the tendency to act in accordance with fairness principles, sincerity, greed-avoidance, and modesty (Ashton & Lee, 2007). We used 10 items that measured honest-humility from the HEXACO-60, a short

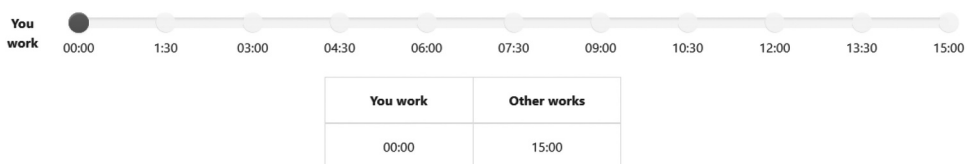


Figure 3. Screenshot showing the measure of time given to the recipient.

personality inventory validated by Lee and Ashton ($\alpha = .81$, K. Lee & Ashton, 2018) (Examples of items are: “I wouldn’t use flattery to get a raise or promotion at work, even if I thought it would succeed” or “If I knew that I would never get caught, I would be willing to steal a million dollars”).

Moral identity centrality

An individual’s self-concept and the relative importance placed on its moral traits is reflected in moral identity centrality (Aquino & Reed, 2002). We measured individuals’ moral identity centrality using the 13-item measure from Aquino and Reed ($\alpha = .86$; Aquino & Reed, 2002).

Positive and negative affect

The positive and negative affect scale (i.e., PANAS; Watson et al., 1988) was used to measure positive and negative affect during the real effort task once after participants had worked on the task for 1 min 30 s.

Procedure

The study was carried out online, and participants were recruited by the *Leibniz Institute for Psychology Information (ZPID)* via MTurk. Participants were paid 5 USD for participating and were instructed that they were able to receive additional payoffs from a real effort task. After the general instructions, participants were asked to complete three questionnaires for assessing social value orientation, honesty-humility, and moral identity centrality.

After participants completed the questionnaires, the real effort task was explained, and participants’ opportunity cost of time were elicited. Participants were then told that for the next task, they would have to play one of two roles: decider or recipient. They were then assigned the role of the decider. The decider had to make two decisions with consequences for themselves and another randomly assigned anonymous participant, the recipient.

Next, participants were asked to decide how they want to split their final earnings and how long they are willing to work for the recipient. Before making a decision, participants were informed that one of their decisions would randomly be selected and carried out. After participants made their choices, the wage for the real effort task was determined. If a participant’s wage was higher than the determined wage, the experiment ended and participants were paid and took their leave. If the wage is equal to or lower than their requested wage, participants received the wage and continued with the task. For these participants, the experiment ended when participants had finished the real effort task. They received their final payoffs and were informed how much they had earned in the role of a recipient (for the timeline of the study, see Figure 4).

All instructions and measures presented in the order in which they appeared in the study can be found in Appendix B. The experiment was carried out online via Otree (Chen et al., 2016). Participants were able to drop out after they had made their decisions but they would not obtain the payoff from the real effort task. Because participants received their fixed payoff after completion of the decision-making task, participants left the experiment after making their decisions at different time points. Participants ($n = 138$)

| Timeline in minutes | +3 | +20 | +25 | +27 | +30 | +31 | +32.5 | +40 (max) |
|-------------------------|----------------|------------------------------|------------------|---|--|--|-------|--------------------|
| General Instructions | Questionnaires | Instruction Real Effort task | Elicit opp. cost | Decision (order counterbalanced across N) | Determine if wage requested <= random number | Real Effort task – randomly determined which | | End |
| Demographic Information | HEX | | | Time | Yes | Work for other | PANAS | Payoff Information |
| Consent | MIC | | | Money | Yes | Work for payoff | PANAS | Payoff Information |
| | SVO | | | | No → End | | | |

Figure 4. Timeline of the study.

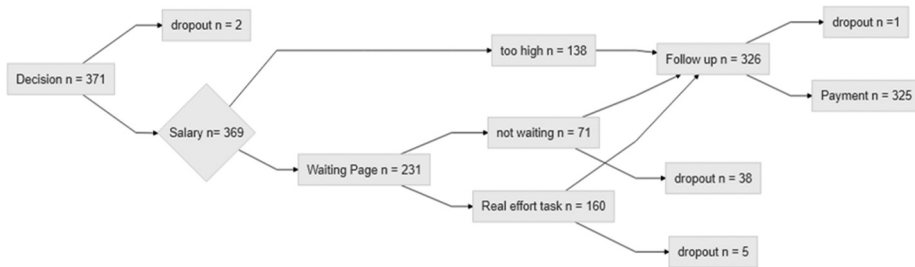


Figure 5. Points of exiting the experiment.

dropped out because their requested salary was too high and n = 71 participants dropped out because no partner could be matched in the agreed upon time. The different points of exiting are shown in Figure 5. Importantly, dropout did not influence the dependent variable generosity, because this was measured before, but only the number of participants in the real effort task which was relevant to the measure of positive affect.

Deviation in the method from the preregistration

Sample

We had planned to carry out the study with a German sample; however, due to the infrastructure available at the ZPID and the crowd working options available which did not allow for individual compensation we decided to use an Amazon MTurk sample, based in the US. The language of the whole experiment was in English not in German as originally planned.

Questionnaires

We had planned to only use the ten items of the HEXACO assessing Honesty-Humility (10 items) but we decided to use the full HEXACO-60 because otherwise, the survey part of the study would have been too short to be conducted with MTurk for the planned monetary compensation.

Real effort task

We had planned that if participants did not adjust the sliders, the 15 min of working time would still end after 15 min, but the working time eligible for payment would be adjusted

accordingly. However, this procedure would have created an asymmetry between the time and money group. In the time condition, participants could have decided to work for the other and appeared as generous but then in the real effort task could have just let the time pass without adjusting sliders. In this case, the other would not receive a payoff. On the other hand, the money group could not retract payoffs from the other already assigned. Therefore, we decided to only count blocks as completed when actually completed and then deduced them from the working time. In that case, non-completion of a block of sliders resulted in longer work, and the task was continued until all the work was completed in both conditions.

Results

Preregistered analysis plan

Exclusion criteria

We excluded participants' data from the analysis if they agreed to carry out the real effort task but then left the study or simply passed the time without working on the task and therefore did not accumulate the time or money as they had agreed to do. This applied to two participants only. All other participants if they were matched also carried out the task.

Transformations

In line with previous research (Davis et al., 2015), we computed a generosity index based on the proportion of time or money given to the other. For the money, allocation generosity is equal to the proportion of the total monetary endowment that was given to the other participant. For the time allocation, generosity is equal to the proportion of the total time that the other person had worked on the task. To be able to compare money and time decisions in relation to the individual opportunity cost of time, we also transformed the time decisions into monetary values. The wage per second, which reflects the opportunity cost of time, was multiplied by the amount of time the participant decided he or she would work for the other expressed in seconds to derive a common scale for both resources.

Computation of scales

Scales were computed according to the instructions for each measure. For social value orientation, the SVO Angle was computed (for details see Murphy et al., 2011). For the honesty-humility facet from the HEXACO model, scale scores were computed as means across all items on a facet after recoding the reverse-keyed items (K. Lee & Ashton, 2018).

Dependent variables

The dependent variable for all the tests was time and money given to the recipient. Because all decisions about how much to give were measured on sliders with the same steps, the scores are directly comparable. The scores range from 0 to 10, and for time and money, 0 represents giving zero and 10 giving the maximum of the resource in question.

Plan of analyses

To test the hypothesis “time is not money,” a paired *t*-test was computed for the generosity index for time and money. To control for participants’ opportunity costs of time to account for the difference, we included the opportunity cost as a covariate in the multi-level model.

To test the hypothesis that giving time feels better than giving money, we computed an independent *t*-test and compared the positive affect participants experienced during the real effort task for participants who worked for their payoff with participants who worked to reduce the amount of work the other anonymous participant had to do.

To test the hypothesis “Giving time is more closely tied to personality than giving money is,” two mixed model regressions were compared, and the change in the adjusted R² was computed. All models contained participants’ ID as a random effect to account for the repeated measures. Model 1 only contains the fixed effects of SVO, honesty-humility, moral identity centrality, and the treatment. Model 2 also contains an interaction between the respective interindividual difference variable and the treatment factor type of resource. The comparison of the adjusted R² allowed us to test whether the model accounting for the interaction between the treatment and personality would yield a better fit, indicating that the personality variables are better predictors of time than the monetary decisions. Because the distribution of generosity was bimodal and non-normal and to ensure that results are not dependent on the modeling, we also used a hurdle model with a logit link function and a beta distribution.

To fit the multilevel linear models we used lmer (Bates et al., 2015), for testing the statistical significance of model parameters we used lmerTest (Kuznetsova et al., 2017). To fit the hurdle model we used glmmTMB (Brooks et al., 2017).

Deviation from original analyses plan

We had planned to control for participants’ opportunity costs of time to account for the difference, by using a repeated-measures ANCOVA with opportunity cost as a covariate. We now just included the predictor opportunity cost of time in the linear-mixed model, which is equivalent with an ANCOVA.

We stated that we would carry out a linear-mixed model as the central analysis to test hypothesis 1 and 3. But because the distribution of generosity was bimodal and non-normal and to ensure that results were not dependent on the modeling, we also used a hurdle model with a logit link function and a beta distribution as an exploratory analysis and for the prediction plot.

As an exploratory analysis, we had planned to examine the relationship between positive affect and the giving of the two resources. We had expected that affect may mediate the effect of personality on generosity moderated by the type of resource but did not find a relationship between affect and generosity as the correlations between positive affect and giving time ($r = .23$, 95%CI [.03,.42], $p = .2$) as well as positive affect and giving money ($r = .19$, 95%CI [-.02,.38], $p = .50$) were not significant. For this reason, we did not carry out further analysis focusing on affect and generosity.

Analyses

The social value orientation measure indicated that the sample consists of two groups, prosocials ($n = 192$) and individualists ($n = 177$). The distribution of the SVO angles is depicted in Figure 6.

Preregistered test of Hypothesis 1 and Hypothesis 3

Participants were more generous when giving time ($M = .34$, $SD = .29$) than when giving money ($M = .21$, $SD = .26$), $d = .45$, $t(370) = -8.704$, $p < .001$. The generosity index of time and the generosity index of money are positively correlated, $r = .5$, $p < .001$. The proportions of generosity in case of time and money, the change of generosity within participants and the correlation between generosity for time and money are shown in Figure 7.

Preregistered linear mixed model

To test whether the effect of the resource depends on the opportunity cost, a mixed model regression was carried out. The reference category for the predictor condition is

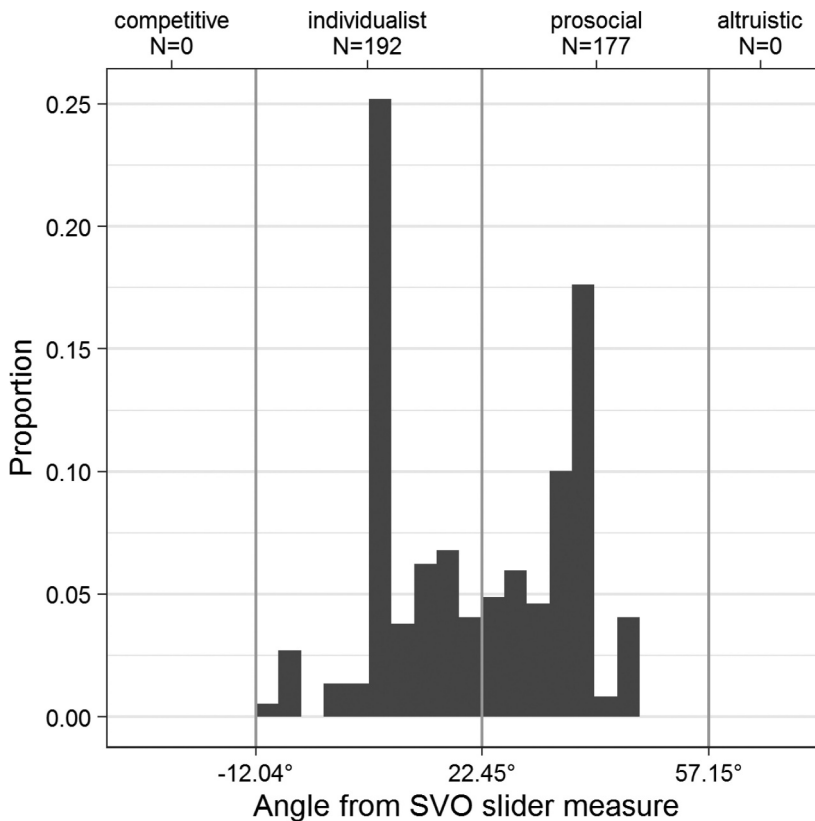


Figure 6. Distribution of SVO scores from the slider measure as represented by angles. The distinction of discrete SVO types along the continuous angle is depicted with vertical lines. The number of cases of each SVO type stated on the top of the plot.

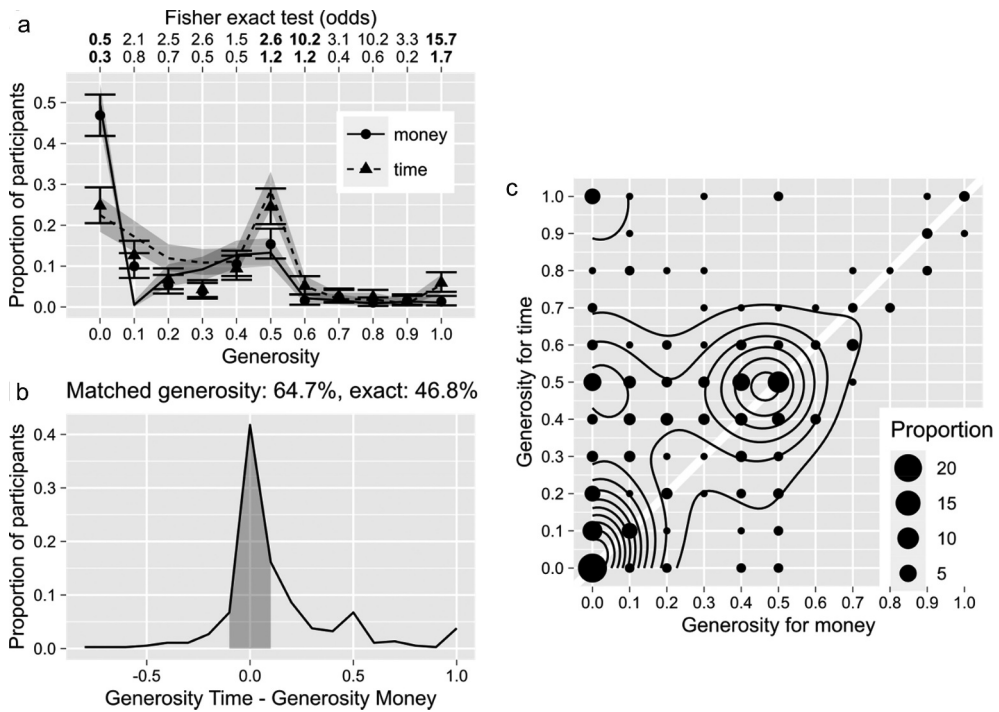


Figure 7. The proportion of generosity for money and time (Plot A), proportion of changes of generosity comparing money and time (Plot B), and generosity for time and money for each participant (Plot C). *Note.* In Plot A, the point and error bars show the observed proportion and 95% CIs for each level of generosity. The line and ribbon show the predicted proportion and 95% CI from the hurdle model. Above the plot are the odds resulting from a Fischer exact test showing the difference between generosity for time and money for the given generosity. In Plot B, the x-axis shows the difference between the Generosity index for time compared to money. Participants on the left were more generous with money than with time, conversely participants on the right more generous with time than with money. The shaded grey area depicts the area where generosity was within a variation of 10%, the cumulated proportion within this area corresponds to the matched generosity. Exact generosity corresponds to the area at the vertical line at zero. Plot C shows Generosity for money and time for each participant. Dot sizes correspond to the proportion of participants for the given combination. The white line depicts the 45° angle which corresponds to a perfect relationship of $r = 1.00$. The area outlined with black depicts the geometric density.

money. First, we tested the effect of condition on generosity, $b = .12$, $t(368) = 8.61$, $p < .001$. In the second model, the opportunity cost for time was entered as a main effect and in the third model, an interaction between opportunity cost and condition was added. No main effect, for opportunity cost, $b = .0003$, $t(367) = 0.85$, $p = .40$, or an interaction of opportunity cost with condition, $b = -.0005$, $t(367) = -1.20$, $p = .23$, was observed. Participants were more generous in decisions about time than in decisions about money and this effect was independent of opportunity costs (see Table 1 for all coefficients).

To test the hypothesis “Giving time is more closely tied to personality than giving money is,” two mixed model regressions were compared, and the change in the adjusted R2 was computed. All models contained participants’ ID as a random effect to account for

Table 1. Results linear mixed regression for generosity.

| Predictors | Main effect condition | | | Main effect condition an opportunity cost | | | Interaction condition*opportunity cost | | |
|---|-----------------------|---------------------|----------|---|---------------------|----------|--|---------------------|----------|
| | <i>b</i> | <i>CI</i> | <i>p</i> | <i>b</i> | <i>CI</i> | <i>p</i> | <i>b</i> | <i>CI</i> | <i>p</i> |
| (Intercept) | 0.21 | 0.19–0.24 | <0.001 | 0.21 | 0.18–0.24 | <0.001 | 0.21 | 0.18–0.24 | <0.001 |
| Condition | 0.12 | 0.10–0.15 | <0.001 | 0.12 | 0.10–0.15 | <0.001 | 0.13 | 0.10–0.16 | <0.001 |
| Opp. costs | | | | 0.00 | –0.00–0.00 | 0.397 | 0.00 | –0.00–0.00 | 0.183 |
| Condition*Opp. costs | | | | | | | –0.00 | –0.00–0.00 | 0.231 |
| Random Effects | | | | | | | | | |
| σ^2 | | 0.04 | | | 0.04 | | | 0.04 | |
| τ_{00} | | 0.04 _{vpn} | | | 0.04 _{vpn} | | | 0.04 _{vpn} | |
| ICC | | 0.50 | | | 0.50 | | | 0.50 | |
| N | | 369 _{vpn} | | | 369 _{vpn} | | | 369 _{vpn} | |
| Observations | | 738 | | | 738 | | | 738 | |
| Marginal R ² /Conditional R ² | | 0.048/0.527 | | | 0.049/0.528 | | | 0.050/0.528 | |

the repeated measures. Model 1 contained the main effects of SVO, honesty-humility, moral identity centrality, and the treatment. Model 2 contained an interaction between the respective interindividual difference variable (SVO, honesty-humility, and moral identity centrality) and the treatment factor type of resource.

First, we fitted a main effects only model with the predictors condition, honesty-humility, social value orientation, and moral identity centrality (all continuous mean variables were mean centered). The results, see Figure S1 and Table 2, show that condition, social value orientation, and moral identity centrality, had a positive effect on generosity, whereas honesty-humility had a negative effect. Adding interaction terms for each personality variable with the condition did not produce a better fit, when comparing the main effects only model to a model including an interaction, all $\chi^2 < 0.75$, $df = 1$, $p > .35$. The consistency of generosity across conditions was not dependent on individual differences as the lack of interaction of any interindividual difference measure with the resource condition indicates.

Importantly, as can be seen in Figure 6 Plot A, the response variable has two peaks for both time and money. Thus, the distribution of the responses violates the assumptions of the linear model, and the models tested are clearly wrong, in that they cannot capture the bimodal shape. For this reason, we also fit a hurdle model as an exploratory analysis to ensure robustness of our results.

Exploratory analysis: hurdle model

Inspecting the distribution of generosity shows two peaks, one peak at zero (i.e., give nothing) and another peak at .5 (i.e., split 50:50). This suggests generosity relies on two different, but sequential processes. First, the decision-maker decides whether to be generous at all. Then, conditional on that first decision, it is decided how much to give, which results in varying degrees of generosity between participants. The hurdle model captures this process by first analyzing the binary decision to be generous or not with a logit model and then using linear regression with beta distribution for the degree of generosity conditional on the decision to give something at all. This approach allows us to distinguish what factors influence the two processes, so we can determine if being generous (binomial) is affected by the same predictors as the decision about the degree of generosity (proportion).

Table 2. results linear mixed regression for generosity on condition, SVO, honesty-humility, moral-identity centrality and opportunity costs.

| Predictors | Main effects | | | Condition*SVO | | | Condition*Honesty-humility | | | Condition*Mic | | |
|---|--------------|---------------------|--------|---------------|---------------------|--------|----------------------------|---------------------|--------|---------------|---------------------|--------|
| | b | 95% CI | P | b | 95% CI | p | b | 95% CI | p | b | 95% CI | p |
| (Intercept) | 0.21 | 0.19–0.24 | <0.001 | 0.21 | 0.19–0.24 | <0.001 | 0.21 | 0.19–0.24 | <0.001 | 0.21 | 0.19–0.24 | <0.001 |
| Condition | 0.12 | 0.10–0.15 | <0.001 | 0.12 | 0.10–0.15 | <0.001 | 0.12 | 0.10–0.15 | <0.001 | 0.12 | 0.10–0.15 | <0.001 |
| SVO | 0.01 | 0.00–0.01 | <0.001 | 0.00 | 0.00–0.01 | <0.001 | 0.01 | 0.00–0.01 | <0.001 | 0.01 | 0.00–0.01 | <0.001 |
| Honesty-humility | -0.03 | -0.06 – -0.00 | 0.028 | -0.03 | -0.06 – -0.00 | 0.028 | -0.04 | -0.07 – -0.00 | 0.026 | -0.03 | -0.06 – -0.00 | 0.028 |
| MIC | 0.10 | 0.07–0.13 | <0.001 | 0.10 | 0.07–0.13 | <0.001 | 0.10 | 0.07–0.13 | <0.001 | 0.09 | 0.05–0.13 | <0.001 |
| Opportunity cost | -0.00 | -0.00–0.00 | 0.951 | -0.00 | -0.00–0.00 | 0.951 | -0.00 | -0.00–0.00 | 0.951 | -0.00 | -0.00–0.00 | 0.951 |
| Condition*SVO | | | | 0.00 | -0.00–0.00 | 0.387 | | | | | | |
| Condition*Honesty-humility | | | | | | | 0.01 | -0.02–0.05 | 0.501 | | | |
| Condition*MIC | | | | | | | | | | 0.01 | -0.03–0.06 | 0.492 |
| Random Effects | | | | | | | | | | | | |
| σ^2 | | 0.04 | | | 0.04 | | | 0.04 | | | 0.04 | |
| τ_{00} | | 0.03 _{ypn} | | | 0.03 _{ypn} | | | 0.03 _{ypn} | | | 0.03 _{ypn} | |
| ICC | | 0.43 | | | 0.43 | | | 0.43 | | | 0.43 | |
| N | | 369 _{ypn} | | | 369 _{ypn} | | | 369 _{ypn} | | | 369 _{ypn} | |
| Observations | | 738 | | | 738 | | | 738 | | | 738 | |
| Marginal R ² /Conditional R ² | | 0.173/0.530 | | | 0.173/0.530 | | | 0.173/0.529 | | | 0.173/0.529 | |

As in the linear-mixed models, we did not find evidence for an interaction of condition with interindividual differences in comparisons with the main effects only model, all $\chi^2 < 1.06$, $df = 2$, $p > .59$. As in the linear model, decisions about time, SVO, and moral identity centrality were associated with a higher degree of generosity as well as a higher likelihood to be giving something away at all. Additionally, the hurdle model showed that honest-humility negatively influences the decision to give, but not how much to give. Results for the hurdle models for the main-effects only model as well as the models for the interaction of condition with each interindividual difference are shown in [Table 3](#).

Preregistered test of Hypothesis 2

Participants who worked for the recipient experienced lower positive affect ($n = 36$, $M = 28.9$, $SD = 10.4$) than participants who worked for money ($n = 54$, $M = 30.8$, $SD = 10.5$), albeit this difference was not significant, $d = .18$, $t(74.4) = -0.86$, $p = .40$. The number of participants working for the recipient differs from the number of participants working for money because in the time condition working was dependent on participants' decision. The correlations between positive affect and giving time ($r = .23$, 95%CI [.03, .42], $p = .22$) as well as positive affect and giving money ($r = .19$, 95%CI [-.02, .38], $p = .50$) were not significant.

Discussion

The purpose of the study was to examine whether participants were equally generous with time and an equivalent amount of money. First, we asked participants to state their opportunity costs for 15 min of their time working on a real effort task. Next, they decided on a proportion of the expected monetary reward that they would donate to another (anonymous) participant, and on the proportion of the time they would be willing to work extra for the benefit of another participant unbeknown to them.

First, we observed that the participants' choices were tightly clustered around 0.0 and 0.5 proportion with only a few participants opting for intermediate values. Second, we found that approximately half of the participants were perfectly consistent in their resource valuation and were willing to give away the same proportion of time and money. However, almost a third of the participants strongly differed in their generosity and tended to give away a larger proportion of time (typically 0.5) than money (typically 0.0) despite their original matching valuation. Finally, we report that their generosity was correlated with their social value orientation, honesty-humility score, and moral identity centrality, but individual differences did not moderate the effect of resource (time vs. money) on generosity. We did not find convincing evidence that positive affect was influenced by generosity or that giving time resulted in more positive affect than giving money.

It matters how you ask

At face value, our results show that people are more generous with time than money. This interpretation assumes that people accurately stated their opportunity cost. However, that creates a paradox. If the two resources were equivalent based on participant's

Table 3. Regression results for the hurdle models.

| Predictors | Main Effects | | | Condition*SVO | | | Condition*Miq | | | Condition*Honesty-humility | | |
|---|--------------|-------------|--------|---------------|-------------|--------|---------------|-------------|--------|----------------------------|-------------|--------|
| | Estimates | CI | p | Estimates | CI | p | Estimates | CI | p | Estimates | CI | p |
| Conditional Model | | | | | | | | | | | | |
| (Intercept) | 0.65 | 0.53–0.79 | <0.001 | 0.65 | 0.53–0.79 | <0.001 | 0.65 | 0.53–0.80 | <0.001 | 0.65 | 0.53–0.79 | <0.001 |
| Condition | 1.39 | 1.19–1.62 | <0.001 | 1.39 | 1.18–1.63 | <0.001 | 1.38 | 1.18–1.62 | <0.001 | 1.39 | 1.19–1.63 | <0.001 |
| SVO | 1.02 | 1.01–1.03 | 0.005 | 1.02 | 1.00–1.03 | 0.018 | 1.02 | 1.01–1.03 | 0.005 | 1.02 | 1.01–1.03 | 0.005 |
| Miq | 1.36 | 1.04–1.77 | 0.026 | 1.36 | 1.04–1.77 | 0.026 | 1.33 | 0.97–1.83 | 0.076 | 1.36 | 1.04–1.77 | 0.026 |
| Honesty-humility | 0.95 | 0.76–1.19 | 0.664 | 0.95 | 0.76–1.19 | 0.664 | 0.95 | 0.76–1.19 | 0.662 | 0.90 | 0.69–1.17 | 0.432 |
| Condition*SVO | | | | 1.00 | 0.99–1.01 | 1.000 | | | | | | |
| Condition*Miq | | | | | | | 1.03 | 0.80–1.32 | 0.843 | | | |
| Condition*Honesty-humility | | | | | | | | | | 1.09 | 0.89–1.34 | 0.411 |
| Zero-Inflated Model | | | | | | | | | | | | |
| (Intercept) | 0.75 | 0.48–1.15 | 0.187 | 0.75 | 0.48–1.16 | 0.192 | 0.75 | 0.48–1.15 | 0.188 | 0.74 | 0.48–1.15 | 0.187 |
| Condition | 0.12 | 0.06–0.24 | <0.001 | 0.12 | 0.06–0.24 | <0.001 | 0.12 | 0.06–0.24 | <0.001 | 0.12 | 0.06–0.24 | <0.001 |
| SVO | 0.93 | 0.90–0.96 | <0.001 | 0.92 | 0.89–0.96 | <0.001 | 0.93 | 0.90–0.96 | <0.001 | 0.93 | 0.89–0.96 | <0.001 |
| Miq | 0.20 | 0.10–0.40 | <0.001 | 0.20 | 0.10–0.40 | <0.001 | 0.20 | 0.09–0.43 | <0.001 | 0.20 | 0.10–0.40 | <0.001 |
| Honesty-humility | 1.63 | 1.01–2.62 | 0.047 | 1.63 | 1.00–2.64 | 0.048 | 1.62 | 1.01–2.62 | 0.047 | 1.50 | 0.87–2.58 | 0.143 |
| Condition*SVO | | | | 1.01 | 0.98–1.05 | 0.487 | | | | | | |
| Condition*Miq | | | | | | | 1.03 | 0.51–2.11 | 0.928 | | | |
| Condition*Honesty-humility | | | | | | | | | | 1.20 | 0.67–2.17 | 0.538 |
| Random Effects | | | | | | | | | | | | |
| σ^2 | | 0.02 | | | 0.02 | | | 0.02 | | | 0.02 | |
| τ_{00} | | 1.69 | vpjn | | 1.69 | vpjn | | 1.69 | vpjn | | 1.69 | vpjn |
| ICC | | 0.99 | | | 0.99 | | | 0.99 | | | 0.99 | |
| N | | 369 | vpjn | | 369 | vpjn | | 369 | vpjn | | 369 | vpjn |
| Observations | | 738 | | | 738 | | | 738 | | | 738 | |
| Marginal R ² /Conditional R ² | | 0.073/0.991 | | | 0.073/0.991 | | | 0.072/0.991 | | | 0.075/0.991 | |

Note. The conditional model shows the estimated effect of the predictors on the degree of generosity conditional on the decision to be generous at all. The zero-inflated model shows the estimated effect of the predictors on the likelihood to be not generous (i.e. give zero). The estimates shows odds

exchange rate, one would expect that their generosity, in terms of a proportion they share, should be the same. For example, once you decide on the exchange rate (e.g., 10 USD for 15 minutes), your two resources should be equalized and, therefore, a given proportion of time (e.g. 0.5 or 7.5 minutes) should be as valuable as the same proportion of money (e.g. 0.5 or 5 USD). Yet, we found that a substantial number of participants opted for a different proportion of time and money to give away and giving away, respectively, keeping also expresses the value of a good. This implied inconsistency between both methods – opportunity cost elicitation and sharing time and money – indicates different exchange rates. We do not know which valuation method is more accurate! If we take the proposed opportunity cost, then people are indeed more generous with time. However, it is also possible that they are more accurate when deciding on what to give away and, therefore, it is their reported opportunity costs that are unreliable.

One possibility of why participants may change their minds could be their perception of whether a particular resource is renewable. For example, giving time may mean to truly lose it, whereas giving money means only foregoing some potential payoff, which could be attained later. However, in this case, the loss would be in the time condition and this would suggest that time should be valued more, not less. Alternatively, decisions about time could be based on an intuitive mode of thinking whereas decisions about money are guided by a deliberate mode of thinking (Leonard et al., 2015). For example, it is observed that social decision based on intuitive thinking are more cooperative than social decisions based on deliberation (Rand, 2016, 2017; Rand et al., 2012). Thus, maybe for some participants, the decision about giving time was made in an intuitive fashion, which then resulted in higher generosity. Finally, it is possible that giving up time is not really a loss and, therefore, makes one feel better than giving away money (Brown et al., 2019; Davis et al., 2015; Reed et al., 2015). Thus, there may be an inherent value in giving away time. This argument would imply that giving time induces a higher “warm glow” of giving (Brown et al., 2019). However, this explanation is challenged by the lack of evidence in the present study for differences in positive affect when comparing individuals giving time with individuals giving money.

Our results highlight the context-dependent nature of resource valuation. Similarly, the valuation of a resource differs depending on whether asked about the price one is willing to pay or the prices people are willing to accept for a good, (i.e., a gap between seller and buyer prices) (Horowitz & McConnell, 2002; Kahneman et al., 1991). Likewise, people differ regarding their preference for a risky option or a safe option depending on whether the decision is framed to be about losses or gains (Kahneman & Tversky, 1984). In short, the valuation of the same resource can vary greatly depending on the question asked and, therefore, the researchers must be careful in interpreting it as an objective (or even an idiosyncratic) truth. Thus, this issue requires further research and a better understanding of relationships between valuations produced by different methods and for different resources.

Discrete choices

We observed that when deciding on the proportion of a resource to give away, the participants effectively chose between being self-oriented (and giving nothing) or fair

(and splitting the pot 50/50) with only a few people opting for in-between values. This was true for both time and money. Moreover, the higher generosity with time reflected primarily participants' decision to switch from self-orientation (for money) to fair behavior (for time). Although this bimodal nature of generosity responses is in line with previous studies on monetary dictator games (Engel, 2011), it is still surprising given the current sample and the task. First, the participants were MTurk workers, who have been shown to be less prosocial than a representative national sample (Hargittai & Shaw, 2020). Second, the endowment was not gained by a windfall but through a real effort task, which is known to decrease generosity (Engel, 2011; List, 2007). Nonetheless, the current results show a strong preference for fairness among a large proportion of participants in a setting that promoted self-interest.

Time and money in interpersonal decisions

Our finding confirms and extends prior work that people differ in generosity between time and money (Davis et al., 2015; Ellingsen & Johannesson, 2009; Lilley & Slonim, 2014). Namely, in previous studies, the effect of the resource (time versus money) was conflated by timing (money was given after it had been earned, whereas the decision to give time was made before it was spent) and task (e.g., waiting or sharing money). In our case, both the timing and the task were identical, thus the observed difference stems from resource difference itself. Our results also extend prior work by showing this resource difference not only at the group level (Brown et al., 2019), but also at the level of the individual participants and by comparing the decision directly. Also, evidence on whether opportunity costs of time (i.e., expressing time in money) are negatively correlated with giving, is mixed with most studies showing no relationship (Bekkers, 2010; Brown et al., 2019; Davis et al., 2015; Ellingsen & Johannesson, 2009; Lilley & Slonim, 2014) but see (Danilov & Vogelsang, 2015). Our results corroborate the former, as we found no dependence between the opportunity cost of time and the willingness to give it.

The observed distribution of generosity with money is in line with meta-analysis (Engel, 2011), even though the money shared by participants was not a windfall. We found higher consistency of generosity between time and money that was given to another participant ($r = .5$), than was found in previous research that considered intentions to give time and money to charity ($r = .24$, Bekkers, 2010). Also, we confirmed that SVO and moral-identity centrality are positively related to generosity and extended these findings by showing that this relationship does not depend on whether time or money is shared. However, we failed to corroborate the hypothesis that interindividual differences are a stronger predictor of generosity when giving time (as compared to money, see Reed et al., 2015). Similarly, we found that SVO was not associated with the stability of generosity. Finally, the tendency to be more generous with time did not depend on SVO and it was exhibited by both individualist and prosocial participants.

Limitations and future research

The present study examined the difference between giving time and giving money in interpersonal decisions and whether interindividual differences were more important for decisions about giving time than for decisions about giving money. Of course, the

results need to be treated with caution when extrapolating to real-world prosocial behavior. For example, working as a volunteer in a charity is one way to give time, but volunteering is often carried out in a specific organizational context, linked to relationships, and extends over longer periods of time (Penner et al., 2004). Furthermore, the decision to give time or money on one occasion probably differs from decisions to give time or money repeatedly over extended periods of time as suggested by findings that spontaneous one-time helping and planned long-term helping have different antecedents (Greitemeyer et al., 2006).

Here, we did not find evidence that working for personal gain or for the gain of someone else resulted in differences in positive affect. However, note that we did not measure positive affect during or right after the decision, but *during* the completion of the real effort task. Thus, our findings do not allow generalization to the experience of ‘warm glow’ from prosocial acts in general (Andreoni, 1990; Brown et al., 2019; Dunn et al., 2014). Furthermore, as we measured positive affect during the real effort task, not all participants arrived at this point of the study because of their choice (not wanting to work for someone else) or the lack of a matching partner available in the given waiting time. Importantly, the choice not to work for someone else was correlated with generosity and therefore was a confounding variable. Accordingly, future studies should compare the experienced positive affect while controlling for the generosity of giving time or money. We were not able to implement this approach due to the limited sample size which was caused by the nature of the study.

Conclusions

By directly comparing decisions about sharing time and money for the same individual, we found that people are more generous when giving time than money and this effect is not dependent on the opportunity cost of time. We think that our experiment is the first experiment to unambiguously show this effect. In addition, for people who did decide to share a resource, we observed a strong tendency to offer a fair share of it (50/50) rather than an intermediate amount.

Note

1. We are aware that a simulation of the necessary power could also be carried out using an F test for the difference in the adjusted R^2 . However, information about the expected change in R^2 is even more scarce than information about the possible correlations. For this reason, we decided to use the convenient and less complex test. Furthermore, no standard procedure to estimate power for mixed-level models is available.

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Changes from the Preregistration

As agreed with the editor we made changes in the introduction to improve the clarity of the purpose of the study and changes did not affect Hypothesis, Design and Methods. A detailed account of all changes (Introduction, Method and Analysis) can be found in the electronic supplement “Changes_from_prereg.docx”. All changes in the methods were approved by the editor.

Data Availability Statement

All materials including the, analysis scripts, instructions and experimental materials, and the data sets are available online. The preregistration, power analysis protocol and the experimental material can be found here: <http://dx.doi.10.23668/psycharchives.2780>. The data can be found here: <http://dx.doi.10.23668/psycharchives.3472>. The analysis script can be found here: <http://dx.doi.10.23668/psycharchives.3473>. All analyses have either been preregistered or marked as exploratory. All deviations from the preregistrations are stated.

Disclosure statement

We confirm that there are no relevant financial or non-financial competing interests to report.

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