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## Article

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Article

# From Windfall Sharing to Property Ownership: Prosocial Personality Traits in Giving and Taking Dictator Games

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**Abstract:** The dictator game is a well-known task measuring prosocial preferences, in which one person divides a fixed amount of windfall money with a recipient. A key factor in real-world transfers of wealth is the concept of property ownership and consequently the related acts of giving and taking. Using a variation of the traditional dictator game ( $N = 256$ ), we examined whether individual differences under different game frames corresponded with prosocial personality traits from the Big Five (politeness, compassion) and HEXACO (Honesty-Humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, Openness to Experience) (honesty-humility, agreeableness) models. In the Big Five model, the effects of prosocial personality traits were generally stronger and more consistent for taking than for giving, in line with a “do-no-harm” explanation, whereby prosocial individuals felt less entitled to and less willing to infringe on the endowments of others. In contrast, HEXACO honesty-humility predicted allocations across both frames, consistent with its broad association with fair-mindedness, and providing further evidence of its role in allocations of wealth more generally. These findings highlight the utility of integrating personality psychology with behavioral economics, in which the discriminant validity across prosocial traits can shed light on the distinct motivations underpinning social decisions.

**Keywords:** dictator game; framing effects; personality; Big Five; agreeableness; honesty-humility

## 1. Introduction

Studies of social decision making in psychology and economics typically measure other-regarding preferences through transfers of scarce resources (such as money) between individuals [1]. In one of the most well-known paradigms, the dictator game, one player must divide a fixed amount of windfall money with a second player [2,3]. The dictator game is interpreted as a measure of prosociality and fairness, and over a hundred studies have shown that dictators are not completely selfish, which suggests that other-regarding concerns are at play [4]. Although dictators allocate on average 28% of the endowment to their partner [4], there is considerable heterogeneity between individuals, which has been linked to personality traits reflecting good manners and fair-mindedness [5–9]. However, a key parameter in transfers of wealth that is absent in the standard dictator game is property ownership and the associated acts of giving or taking. In the current research, we move beyond simple windfall sharing in the standard dictator game and examine how initial ownership and the giving-taking frame are associated with traits from major models of personality to determine prosociality. We find a different pattern of results across the two models, in which prosocial personality traits from the Big Five predicted taking (but not non-giving), pointing to a harm-aversion explanation. In contrast, HEXACO (Honesty-Humility, Emotionality, eXtraversion, Agreeableness,

Conscientiousness, Openness to Experience) honesty-humility was broadly associated with greater allocations across both giving and taking frames, which may be explained by its underlying general tendency for fair-mindedness.

### 1.1. Property Ownership and Giving-Taking Frame

Norms around ownership and property rights play a critical role in the transfer and distribution of scarce resources. Property ownership has evolutionary roots, with many animals displaying a predisposition to acquire and retain food and territory [10]. Among humans, rules around property ownership are learned from a young age [11], and the concept of defending one's own possessions and respecting those of others has existed in human culture since prehistory [12]. Closely tied to this is the act of giving and taking, which is contingent on the recognition of ownership. It is through ownership that one gains the rights to undertake certain actions regarding his or her property, such as using, giving, or exchanging it, as well as excluding others from accessing or taking it [13]. Many forms of prosociality, such as donations to charity and volunteering, involve giving away one's own money, time, and other resources, while antisocial behaviors such as theft involve taking another's property without consent.

In economic decision-making paradigms as well, the concept of property rights and the distinction between giving and taking affect other-regarding behavior. Variations of the dictator game have shown that giving and taking are not equivalent and produce different allocations of wealth. In one study [14], property rights in the dictator game were legitimized by having participants earn the initial endowment based on their performance on a quiz. Here, none of the dictators allotted any money to recipients when the endowment was earned by the dictator (i.e., analogous to giving), while many allotted more than half of the endowment when this had been earned by the recipient (i.e., analogous to non-taking).

Furthermore, this discrepancy can be produced by the mere perception of ownership through arbitrary assignment at the outset of a task. This may be a form of the first possession heuristic, whereby people infer ownership based on who first possessed an item or resource [15]. An example of this is the children's adage, "finders, keepers", in which any unowned or abandoned object belongs to the person who first discovers and claims it. In the ultimatum game, Leliveld, van Dijk and van Beest [16] manipulated initial ownership with an illustration that positioned monetary chips on the participant's side of the table (giving), the partner's side of the table (taking), or the middle of the table (splitting). Participants in the giving condition allotted the lowest proportion of chips to their partner, followed by those in the splitting condition, while those in the taking condition allotted the highest proportion, the effects of which were mediated by perceptions of entitlement. Several studies [17–19], but not all [20,21], have similarly demonstrated sensitivity to giving-taking frames, even in spite of equivalence in final payoffs.

This asymmetry between the utility of the "warm glow" of doing good and the disutility of the "cold prickle" of doing bad has long been recognized in economic decision making [22]. There are at least two explanations for why the latter may loom larger than the former in dictator and ultimatum games [16]. One is related to people's aversion to taking, which can be attributed to an other-oriented "do-no-harm" principle [23], or a reluctance to hurt others given their entitlement to the endowment [16]. After all, the concept of harm is central to moral cognition and is considered the strongest predictor of moral judgments, with harm-care being the most common moral dimension encountered in everyday life [24,25]. The second relates to people's diminished willingness to give [16]. This may be due to a self-oriented endowment effect, in which people value an item that they own more than one they do not own and, as a result, are less willing to relinquish their own property when bargaining [26]. This tendency to overvalue what is owned is thought to stem from the phenomenon of loss aversion [27,28], in which people weight losses more heavily than commensurate gains. Nevertheless, previous research has supported the other-oriented "do-no-harm" account over the self-oriented loss aversion explanation, with three experiments showing that players honoured

the entitlements of their partners and did not change their behavior even when it was strategic and self-serving to do so [16].

### *1.2. Prosocial Personality Traits and Their Relevance for Allocations of Wealth*

If giving and taking are indeed underpinned by separate psychological processes, then they may also correspond to different personality traits capturing distinct motivations. One way to examine this is by integrating economic decision-making paradigms with taxonomic models of personality, which provide an organizing framework for individual differences in patterns of behavior and experience [29]. Of particular relevance are the prosocial domains, consisting of personality traits that confer benefits on other individuals (e.g., helping, sharing, and cooperating). These traits are organized differently within two major models of personality: the Big Five [30–33] and the HEXACO [34–36].

In the Big Five model, prosocial traits are located within the broad domain of agreeableness, the general tendency to be altruistic and cooperative [37]. According to recent influential models of the Big Five hierarchy [38,39], agreeableness subsumes multiple prosocial tendencies, which can be grouped into two or three narrower traits, known as aspects [38] or facets [39]. In particular, politeness (also known as respectfulness) reflects the tendency to be considerate and respectful and to refrain from aggressive, norm-violating impulses, whereas compassion reflects the tendency to be emotionally concerned about others [38]. While both contribute to the maintenance of interpersonal harmony, the two are thought to be underpinned by different biological substrates and diverge with respect to other socio-moral individual differences [40–42].

The HEXACO model [34–36] is a six-factor model of personality that organizes the prosocial domain differently from the Big Five. The primary difference between the two concerns the addition of a sixth broad dimension, HEXACO honesty-humility, which describes the tendency to be fair-minded, non-exploitative, and modest and which captures trait variance beyond that of the Big Five [43]. In addition, HEXACO agreeableness reflects the tendency to be forgiving, patient, and lenient (and thus is not interchangeable with Big Five agreeableness, which is a general prosocial domain). Together, HEXACO honesty-humility and agreeableness are thought to distinguish between individual differences in two complementary forms of reciprocal altruism: honesty-humility with active cooperation (i.e., the tendency to cooperate with others despite the opportunity to exploit them) and agreeableness with reactive cooperation (i.e., the tendency to cooperate with others despite their transgressions) [35,44].

Examining how different personality traits correspond with individual differences in economic games can shed light on the discriminant validity between similar prosocial constructs, thus distinguishing between the motivations driving economic decisions. When it comes to the sharing of windfall money in the standard dictator game, mounting evidence has demonstrated the role of the politeness aspect of Big Five agreeableness and, to a greater extent, HEXACO honesty-humility, which appear to be robust across hypothetical and incentivized decisions, student and community samples, as well as across several different countries [5,6,29,44].

Prosociality in the standard dictator game thus appears to stem from non-exploitativeness and adherence to social norms, rather than compassion or emotional concern for others. This is unsurprising given that the standard dictator game, like many economic games, is a decontextualized exercise dealing with windfall money. In the absence of any clear cues of deservingness or ownership over such “manna from experimental heaven” [45] (p. 216), these encounters may evoke norms around sharing and reveal personality traits corresponding with relevant tendencies of fair-mindedness and non-aggression. A major concern with the dictator game is that it is an artificial task in which contextual cues can be easily tweaked to produce diverse norms and social preferences [46,47]. Indeed, there are relatively few real-world analogues of the dictator game, and it has been difficult to faithfully reproduce in natural settings [48]. It is therefore important to build on this simple task of windfall sharing to better understand the richer range of social decisions involving allocations of wealth.

### 1.3. Aims and Overview of the Current Research

We aimed to examine the effects of ownership and give-take framing in the dictator game and their relations with prosocial personality traits. In line with previous research, we tested the confirmatory hypothesis that there would be greater allocations to a recipient when decisions were framed as taking rather than as giving (H1).<sup>1</sup> We further tested the exploratory hypothesis that individual differences in both giving and taking would replicate previous trait effects of the politeness aspect of Big Five agreeableness (H2) and HEXACO honesty-humility (H3) in windfall sharing. Both are conceptually similar constructs characterized by the absence of antisocial tendencies (e.g., “Take advantage of others” for politeness, “I would be tempted to buy stolen property if I were financially tight” for honesty-humility, both reversed) [38,49], and honesty-humility specifically has been negatively associated with crime and delinquency [43]. In contrast, the compassion aspect of Big Five agreeableness reflects proactive tendencies centered on the emotional wellbeing of others (e.g., “Like to do things for others”). Based on this, we made the exploratory hypothesis that it would predict allocations under a giving, but not necessarily taking, frame (H4).

## 2. Materials and Methods

This study was approved by the Human Ethics Advisory Group of the Melbourne School of Psychological Sciences, The University of Melbourne (HREC number: 1341055.7) and was conducted in accordance with relevant guidelines and regulations. All participants provided informed consent via an electronic survey according to the established guidelines of the group.

In line with recommendations for research integrity [50], we report how we determined our sample size, all data exclusions, all manipulations, and all measures below and in the Supplementary Materials. We aimed for a target sample of at least  $N = 110$  per condition, which would provide approximately 80% power [51] to identify the predicted effect sizes based on previous studies of the role of prosocial personality traits in the standard dictator game ( $r_s = 0.17\text{--}0.32$ ) [6,52], as well as average effect sizes in personality research ( $r = 0.24$ ) [53]. Reasons for excluding participants are described in the Procedure Section.

A preliminary study investigating the role of prosocial personality traits in giving-taking dictator games was initially conducted before the current study. The design of this study was almost identical to the current study with the exception that participants read vignettes about an imaginary dictator game and were asked to provide hypothetical allocations of money. Although this study demonstrated a significant framing effect, these findings are treated with some caution given concern about the validity of results when using hypothetical decisions in the absence of incentives [54,55]. For transparency, a description and summary of the findings from this study are presented in the Supplementary Materials (Text S1, Tables S4 and S5).

### 2.1. Participants

The final sample consisted of 256 residents in the United States of America (USA; aged 19–67 years,  $M_{\text{age}} = 34.8$ ,  $SD = 11.0$ ; 43% female) recruited from the online marketplace Amazon Mechanical Turk (MTurk), who completed the study for monetary payment.

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<sup>1</sup> In the current research, we were specifically interested in the separate processes of giving and taking. However, we recognize that many examples in the real world feature an unbounded choice set of distributive behaviors that are also important to study in unison. Studies that combine giving and taking choice sets report yet another pattern of findings, showing that introducing the option to take in a giving game reduces allocations to one's partner considerably [46,47].

## 2.2. Materials

### 2.2.1. Personality Measures

Participants completed the Big Five Aspect Scales [38], a measure of five broad domains of personality (neuroticism, agreeableness, conscientiousness, extraversion and openness/intellect), each of which can be divided into two lower-order aspects. We were particularly interested in the politeness and compassion aspects of the agreeableness domain. These each consist of 10 items, to which respondents rate their agreement on 5-point Likert-type scales (1 = strongly disagree, 5 = strongly agree). The Big Five Aspect Scales (BFAS) is well-validated against other measures of the Big Five and has good internal consistency and reliability [38].

In addition, participants completed part of the HEXACO Personality Inventory—Revised (HEXACO-PI-R) [34], a measure of six broad domains of personality (honesty-humility, emotionality, extraversion, agreeableness, conscientiousness and openness to experience). Each domain scale comprises 16 items, to which participants respond using a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree). Participants completed 36 items of the prosocial domains of honesty-humility and agreeableness, as well as the interstitial facet altruism, which consists of four items measuring the broad tendency to be sympathetic and soft-hearted.

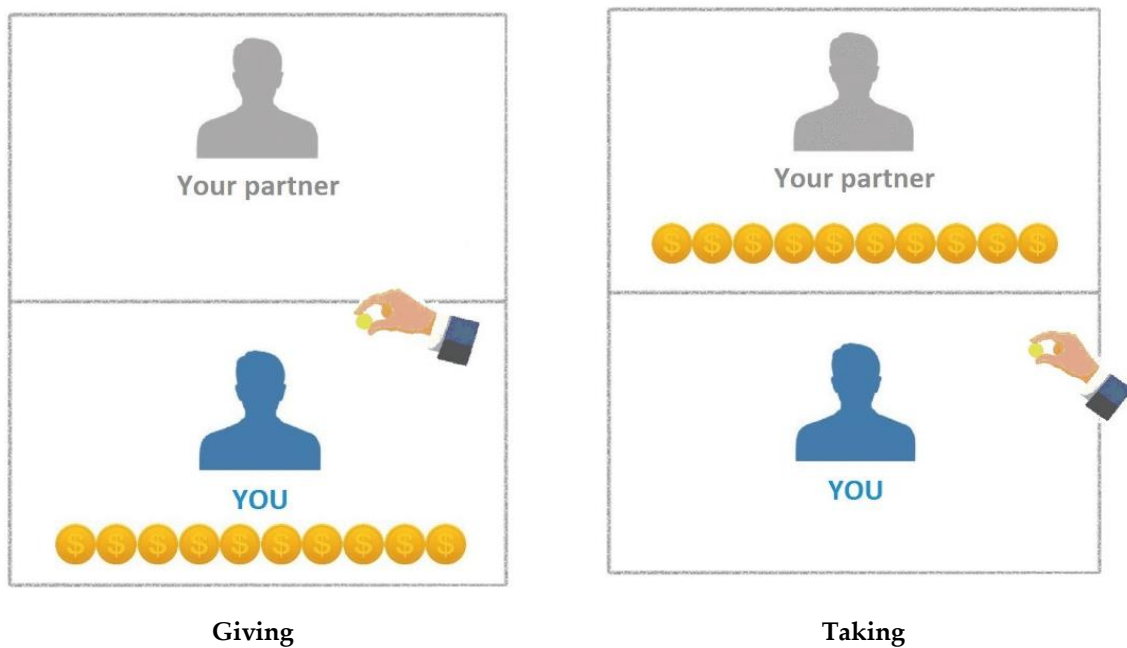
### 2.2.2. Dictator Games

Participants played one of two versions of a modified dictator game, which differed with respect to the action required—giving or taking—for the allocation of wealth. Monetary units were points with a conversion rate of 1 point = USD 0.10. Although these stake sizes may seem somewhat low relative to standard practices in economics, they were considered appropriate in light of evidence that stake sizes have little to no effect on allocations in dictator games [4,56,57]. Instructions are provided in Appendix A.

In the giving game ( $N = 131$ ), participants read about an experimental task in which they began with 10 points and their partner with 0 points. They then read that they could give their partner any of this between 0 points and 10 points in increments of one (e.g., “I would give 0 points to my partner”). Accompanying this text was a Graphics Interchange Format (GIF) visualization of a table divided in the middle, with an icon indicating the participant in the bottom half, an icon indicating the partner in the top half and 10 coins on the participant’s side of the table (see Figure 1). This GIF featured a moving hand holding a coin travelling from the participant to the partner in a giving gesture.

The taking game ( $N = 125$ ) was the reverse of the giving game. That is, participants read about a task in which they began with 0 points and their partner began with 10 points and that they could take any of their partner’s money between 10 points and 0 points in increments of one (e.g., “I would take 10 points from my partner”). This was accompanied by a similar GIF visualization; however, this time, the 10 coins were positioned on the partner’s side of the table and the moving hand travelled from the partner to the participant in a taking gesture.

After making their decision, participants completed a short post-decision questionnaire about the previous game, by indicating their agreement with 13 randomly-ordered statements on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). One of these statements measured perceived initial ownership of the money (“At the start of the task, I felt that all of the 10 points was in my possession”), which served as a manipulation check. The details of this questionnaire and basic findings are provided in the Supplementary Materials (see Text S2 and Table S6).



**Figure 1.** Screenshots of visualizations presented to participants in the giving (left) and taking (right) dictator games. The giving game featured a moving Graphics Interchange Format (GIF) image of a hand depositing a coin at the partner’s side of the table, while the taking game featured a moving GIF image of a hand retrieving a coin from the partner’s side of the table.

### 2.3. Procedure

Participants completed all game and personality measures on a survey programmed using Qualtrics Survey Software. The session featured additional tasks and questionnaires beyond the scope of the current research, which are listed in the Supplementary Materials (see Table S1). However, all participants completed the dictator game first. Participants were instructed that one of the games that they completed during the study was pre-selected to form their bonus payment and would be revealed at the end of the study, similar to the conditional information lottery approach [58].

Participants were randomly assigned to one of the two dictator games and then completed the post-decision questionnaire. They later completed the BFAS, followed by the HEXACO-PI-R. This order was selected to avoid any spillover effects of prosocial personality measures on behavior. Embedded within the personality measures were two attention checks (e.g., “Please select Strongly Agree”). Ten participants (3.8%) were excluded for failing at least one attention check.

Participants were paid US\$8.00 for their time, in addition to a bonus payment of US\$0.50. The median time for study participation was 42 min.

### 2.4. Re-Analysis of Previous Data

For comparison with allocations, we included previous data from a neutrally-framed standard dictator game ( $N = 191$ ; aged 18–74 years,  $M_{\text{age}} = 36.9$ ,  $SD = 12.0$ ; 53% female), collected in a near-identical fashion from a sample of MTurk workers from the USA and analysed in a study of the public goods game [59]. In this task, participants read a description of the standard dictator game and were asked to distribute the 10 points (in increments of one) in the role of the first player (e.g., “0 points for myself and 10 points for my partner”). Similar to the current study, monetary units were points with a conversion rate of 1 point = USD 0.10. Note that the number of participants reported here differs from that reported previously [59]; this is due to different selection criteria in the current analysis (i.e., passing two attention checks) compared with the previous analysis (i.e., passing two attention checks and a comprehension check for the public goods game).

### 3. Results

#### 3.1. Preliminary Statistics

##### 3.1.1. Personality Variables

Descriptive statistics and bivariate correlations between personality and game variables are presented in Table 1. The politeness aspect of Big Five agreeableness was strongly correlated with both honesty-humility ( $r_s = 0.48, p < 0.001$ ) and agreeableness ( $r_s = 0.52, p < 0.001$ ) from the HEXACO model. The compassion aspect of Big Five agreeableness was more strongly correlated with agreeableness ( $r_s = 0.42, p < 0.001$ ) than honesty-humility from the HEXACO model ( $r_s = 0.27, p < 0.001$ ).

**Table 1.** Descriptive statistics and bivariate correlations between prosocial traits and dictator allocations.

	Variable	N	Mean (SD)	Correlations				
				1	2	3	4	5
1	B5 Agreeableness	256	3.80 (0.60)	<b>0.91</b>	0.98 **	0.98 **	0.46 **	0.59 **
2	B5 Compassion	256	3.77 (0.76)	0.90 **	<b>0.92</b>	0.64 **	0.30 **	0.47 **
3	B5 Politeness	256	3.83 (0.63)	0.85 **	0.56 **	<b>0.82</b>	0.57 **	0.61 **
4	HEX Honesty-Humility	256	3.39 (0.70)	0.41 **	0.27 **	0.48 **	<b>0.87</b>	0.35 **
5	HEX Agreeableness	256	3.09 (0.65)	0.53 **	0.42 **	0.52 **	0.31 **	<b>0.88</b>
6	Allocation in Giving DG	131	3.00 (2.37)	−0.003	−0.02	0.05	0.32 **	−0.01
7	Allocation in Taking DG	125	3.56 (2.60)	0.32 **	0.32 **	0.23 *	0.28 **	0.10
<i>Re-analysis of Previous Data</i>								
8	Allocation in Neutral DG	191	3.55 (2.17)	0.11	0.07	0.16 *	0.29 **	−0.10

Note: Cronbach's  $\alpha$ s are shown in the diagonal. Bivariate correlations are calculated using Spearman's rho. Correlations corrected for attenuation are presented above the diagonal. Game allocations indicate the amount that the partner received out of 10 points. Total  $N$  and means for personality data refer to combined giving and taking conditions. B5 = Big Five Model, measured using the Big Five Aspect Scales (BFAS) [38]. DG = Dictator Game. HEX = Honesty-Humility, eXtraversion, Agreeableness, Conscientiousness, Openness to Experience (HEXACO) model, measured using the HEXACO Personality Inventory—Revised (HEXACO-PI-R) [34]. \*  $p < 0.05$ . \*\*  $p < 0.01$ .

##### 3.1.2. Game Allocations

For consistency, all dictator game results are described in terms of the amount of money that a partner receives, regardless of the giving or taking frame. Mean allocations in the giving and taking games are presented in Figure 2, compared with 3.55 in a previous neutrally-framed standard dictator game [59]. This average allocation is similar to those reported in previous incentivized studies of the standard dictator game in non-student and community samples (i.e.,  $M$ s = 3.20, 3.41, 3.50) [52,60,61]. Allocations were marginally higher in the taking ( $M = 3.56$ ) than giving game ( $M = 3.00$ ),  $t(254) = 1.80$ ,  $p = 0.07$ .

As demographic variables are often associated with prosocial behavior in economic games [62,63], we examined the role of age and gender. Age was not correlated with allocations in either the giving or taking game ( $ps > 0.24$ ). While allocations did not vary by gender in the giving frame ( $p = 0.42$ ), women ( $M = 4.39$ ) took significantly less of their partner's money than men ( $M = 2.99$ ),  $t(123) = 3.07$ ,  $p = 0.003$ .

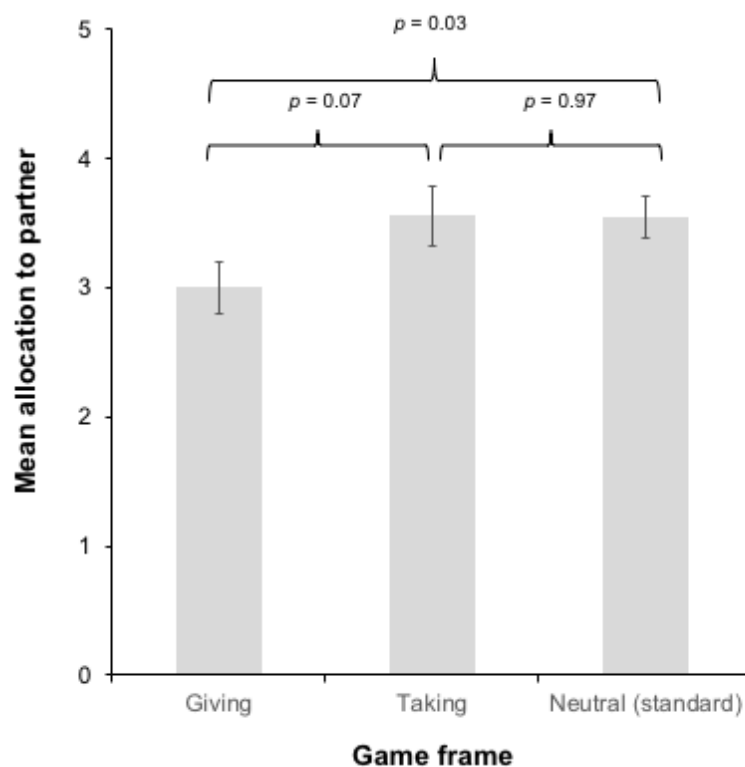
##### 3.1.3. Manipulation Checks

To check the manipulation of initial ownership, we ran an independent samples  $t$ -test comparing participants' agreement (on a five-point scale) with the statement "At the start of the task, I felt that all of the 10 points was in my possession" between the two game frames. Participants in the giving game agreed that the 10 points was in their initial possession more strongly ( $M = 4.27$ ) than those in the taking game ( $M = 2.16$ ),  $t(254) = 14.82$ ,  $p < 0.001$ . We ran an ordinary least squares (OLS) regression on allocations, with frame (giving = 0, taking = 1) and perceptions of ownership as independent variables. Here, only perceptions of ownership were a significant predictor of allocations,  $\beta = -0.25$ ,



$t(253) = -2.96, p = 0.003$ , not frame,  $\beta = -0.06, t(253) = -0.67, p = 0.50$ . We ran an additional OLS regression on allocations, with frame, perceptions of ownership, and their interaction as independent variables, although the latter was not statistically significant,  $\beta = 0.02, t(252) = 0.15, p = 0.88$ .

We also examined the relation between perceptions of initial ownership with personality traits. In the taking game, politeness ( $r_s = -0.21, p = 0.02$ ), compassion ( $r_s = -0.24, p = 0.01$ ), and honesty-humility ( $r_s = -0.18, p = 0.04$ ) were all negatively associated with perceptions of ownership, while no significant trait effects were observed for the giving game.



**Figure 2.** Mean allocation by sample and game frame. For comparison, the mean allocation from a neutrally-framed standard dictator game is provided [59]. Game allocations indicate the amount that the partner received out of 10 points. Error bars indicate one standard error.

### 3.2. Correlations between Prosocial Traits and Game Allocations

In the giving game, allocations were not significantly correlated with any of the broad trait domains or aspects from the Big Five model, although they were positively correlated with HEXACO honesty-humility ( $r_s = 0.32, p < 0.001$ ). In the taking game, agreeableness was the only broad trait domain from the Big Five model significantly correlated with non-taking ( $r_s = 0.32, p < 0.001$ ), and this relation appeared slightly stronger for compassion ( $r_s = 0.32, p < 0.001$ ) than politeness ( $r_s = 0.23, p = 0.01$ ). HEXACO honesty-humility was again positively correlated with non-taking ( $r_s = 0.28, p = 0.002$ ), while HEXACO agreeableness was not associated with allocations in both frames ( $ps > 0.26$ ). Correlations between all personality variables from the Big Five model and giving and taking are provided in the Supplementary Materials (see Table S2).

### 3.3. Regression Models of Game Allocations

We ran an OLS regression on allocations with giving-taking frame (giving = 0, taking = 1) and the relevant standardized prosocial traits and their interactions with the game frame entered as independent variables. Because dictator decisions were left- and right-censored, we also applied Tobit models to account for this (see Table S3 in the Supplementary Materials). As the results largely

concurrent with the OLS models, only the former are presented in Table 2 and discussed below. Although prosocial traits within each personality model were intercorrelated, tolerance (0.34–0.99, Big Five model; 0.41–0.99, HEXACO model) and variance inflation factors (1.00–2.90, Big Five model; 1.00–2.42, HEXACO model) did not indicate any evidence of multicollinearity.

In the Big Five model, there was a main effect for frame,  $\beta = 0.12$ ,  $t(250) = 2.03$ ,  $p = 0.04$ , but no main effects for each of the two aspects ( $ps > 0.22$ ). However, there was a significant compassion-by-frame interaction, in which compassion was associated with non-taking, but not giving,  $\beta = 0.30$ ,  $t(250) = 2.98$ ,  $p = 0.003$ .

In the HEXACO model, there was a borderline significant main effect for game frame,  $\beta = 0.12$ ,  $t(250) = 1.93$ ,  $p = 0.05$ , and a main (positive) effect of honesty-humility,  $\beta = 0.34$ ,  $t(250) = 3.58$ ,  $p < 0.001$ , but no interaction between the two ( $p = 0.47$ ), nor any trait effects for agreeableness ( $ps > 0.25$ ).

All findings above were replicated when gender and age were included in the model. All trait effects were replicated when perceptions of ownership were included in the model, while the effect of frame became non-significant.

As there was evidence of non-normally-distributed residuals, a binary logistic regression was also performed. This was done by restricting to dictator allocations with the two most common responses (0 points vs. 5 points;  $N = 212$  or 83% of the full dataset). While the effect of frame became non-significant, all trait effects described above were replicated. However, the interaction between compassion and frame became marginally significant, odds ratio = 1.96,  $p = 0.05$ , in part due to the restricted sample size.

**Table 2.** Regression analysis of prosocial personality traits on the amount allocated to the partner in giving and taking dictator games.

Variable	$R^2$	Adjusted $R^2$	$B$	$\beta$	95% CI	$t$	$p$
<i>Big Five Model</i>							
Intercept			2.98			14.16	<0.001
Frame (giving = 0, taking = 1)			0.61	0.12	0.01, 0.24	2.03	0.04
B5 Politeness			0.31	0.12	−0.07, 0.32	1.23	0.22
B5 Compassion			−0.26	−0.10	−0.30, 0.09	−1.06	0.29
Frame × B5 Politeness			−0.25	−0.07	−0.27, 0.13	−0.72	0.47
Frame × B5 Compassion			1.04	0.30	0.10, 0.49	2.98	0.003
<i>HEXACO Model</i>							
Intercept	0.09	0.07	2.99			14.16	<0.001
Frame (giving = 0, taking = 1)			0.58	0.12	0.001, 0.23	1.93	0.05
HEX Honesty-Humility			0.84	0.34	0.16, 0.51	3.58	<0.001
HEX Agreeableness			−0.26	−0.11	−0.28, 0.07	−1.15	0.25
Frame × HEX Honesty-Humility			−0.24	−0.07	−0.25, 0.12	−0.72	0.47
Frame × HEX Agreeableness			0.17	0.05	−0.13, 0.22	0.51	0.61

Note: B5 = Big Five Model, measured using the Big Five Aspect Scales [38]. HEX = HEXACO model, measured using the HEXACO Personality Inventory—Revised [34].

#### 4. Discussion

Property ownership and the associated act of giving and taking are key parameters in social decisions involving the transfer of wealth, although these have been largely absent in traditional studies of the dictator game, which measure the sharing of windfall money. We investigated allocations of wealth under giving and taking frames and whether these corresponded with prosocial personality traits from major models of personality. There was evidence of individual differences in giving and taking, with the compassion aspect of agreeableness uniquely predicting non-taking, but not giving in the Big Five model. In the HEXACO model, honesty-humility was broadly associated with greater allocations across both frames. Generally, we observed greater and more consistent trait effects in the taking game, where effect sizes were at least as large as those reported in the existing literature on personality and economic games [29], as well as average effect sizes in personality psychology [53].

#### 4.1. Initial Ownership and Differences by the Giving-Taking Frame

One key finding was the asymmetry around the giving-taking frame; that is, people allotted more money to their partner when this involved not taking from their partner compared with giving to their partner. While this effect was significant in our preliminary study using hypothetical dictator allocations (see Text S1 and Tables S4 and S5 in the Supplementary Materials), it was smaller and marginally significant in the current study, providing only weak support for H1. This mirrors the somewhat inconsistent findings in the literature with some [16–19], but not all [20,21] studies reporting sensitivity to the giving-taking frame.

A potential reason for this discrepancy may be the combination of the giving-taking frame and perceptions of initial ownership (and associated feelings of entitlement). While they are frequently conflated in the real world, as they were in the current research, this may not necessarily always be the case. In both the current research and the study by Leliveld et al. [16], initial ownership was clearly signified with an image depicting the endowment of money on the participant's or partner's side of the table and an arrow or hand indicating the action of giving or taking. This manipulation was later confirmed by asking participants about perceived ownership of the endowment. Moreover, the effect of the game frame disappeared when controlling for perceived ownership, suggesting that the difference in allocations was driven by giving and taking specifically with reference to one's ownership of the endowment. Therefore, clear perceptions of ownership may be critical for enhancing the salience of giving and taking, while verbal cues alone (such as focusing on the framing of the allocation decision—giving, taking or keeping—or the label of the game—"giving game" vs. "taking game") [20,21] are perhaps too weak to influence distributions of wealth in the face of real monetary stakes. After all, it is through ownership that one gains the exclusive rights to use or give away property, or withhold access to others [13].

Interestingly, our comparison with previous data revealed that allocations under a taking frame were no different from those in the neutrally-framed dictator game, both of which were greater than those in the giving frame. One reason is that neither frame elicits any sense of perceived ownership over the money. This is an important consideration when designing dictator game experiments, as many studies describe giving interchangeably with distributing, dividing or splitting [4]. Nevertheless, the personality findings below also indicate that distributing money in the neutrally-framed dictator game is not treated synonymously with taking either.

#### 4.2. Prosocial Personality Traits and Giving versus Taking

A novel finding to emerge from the current research is that giving and taking were associated with prosocial traits from major models of personality, although the pattern of results varied across the two models and deviated from our predictions (H2 and H4). In the Big Five model, the absence of a unique effect of politeness is at odds with several studies demonstrating the role of politeness in the standard dictator game [6] and suggests that taking is a psychologically distinct process to dividing or distributing. Given that traits reflect responses to appropriate contextual stimuli [33], this suggests that the effect of politeness in promoting fair allocations of wealth may be specific to instances of windfall sharing where neither party has claim to the endowment.

In contrast, compassion uniquely predicted non-taking, but not giving. Despite content items such as "Like to do things for others", compassionate people were not more likely to give to their partner in the dictator game compared with others. Again, the anonymous nature of the encounter may have been too impersonal to elicit any compassion to promote greater giving. Other researchers have pointed out that empathic traits tend to be relatively weak predictors of altruistic giving in lab-based paradigms [64].

Nonetheless, compassion was inversely associated with taking, and this relation appears to be driven by those on the negative pole of this trait. Individuals one standard deviation below the mean on compassion left on average 2.75 points for their partner, while those one standard deviation above the mean left on average 4.41 points for their partner. While those who were compassionate

kept the split reasonably fair, those low on this trait continued to take to deplete their partner's wealth. Therefore, those low on compassion were willing to "do harm" and infringe on others' property for their own self-interest, inverse to the trait's core feature of emotional concern for others. Together, the findings suggest an interesting asymmetry, with those low on compassion willing to take more than their equal share of their partner's endowment, while those high on compassion not more willing to give an equal share of their own endowment to their partner. While this asymmetry appears to contradict the theoretical basis of compassion, there is evidence that it does play a role in other economic game contexts, namely dictator giving when real-world norms are salient [65] and recompensation of victims of an unfair dictator allocation [52]. We also interpret this significant interaction with some caution given that our sample size was only well-powered to detect zero-order effects.

Overall, we observed stronger and more consistent associations between Big Five prosocial traits and allocations when participants were taking than when they were giving, suggesting that the "cold prickle" of doing bad loomed larger than the "warm glow" of doing good. This pattern of findings lends some support to the explanation that prosocial personality traits promote greater allocations of wealth to others due to an other-oriented principle of "doing no harm" when decisions involve infringing on others' entitlements [16]. The "do-no-harm" explanation also corresponds with the finding that politeness, compassion, and honesty-humility were all negatively associated with the perception of ownership in the taking game. Therefore, prosocial individuals may have refrained from taking due to a lower sense of entitlement over their partner's endowment.

In the HEXACO model, there was a broad association between honesty-humility and greater allocations of money across both frames, providing support for H3. This is reminiscent of a growing body of research linking this trait with a variety of forms of active cooperation in economic games, including dictator allocations, cooperation in the prisoner's dilemma, contributions in public goods games and returns in the trust game [5,29,44,66,67]. These results are also in keeping with a recent study featuring a redistribution paradigm, in which honesty-humility was associated with both giving to one's partner when one was initially endowed with relatively more and abstaining from taking from one's partner when the partner was initially endowed with relatively more [68]. Together, this provides further support for the HEXACO model in economic games, indicating that honesty-humility is a defining feature when it comes to individual differences in resource distribution regardless of subtle variation in framing and choice sets. Common to all of these zero-sum tasks is the fact that prosocial behavior depends on suppressing the selfish urge to reap more money for one's self at a partner's loss. The inverse of honesty-humility consists of aggressive and Machiavellian tendencies [69], and those high on these traits may show a generalized response of exploiting their partner across all variations of the dictator game. Indeed, many items on the honesty-humility scale specifically concern preferences for money and responses to monetary incentives that come at a moral or ethical cost (e.g., "Having a lot of money is not especially important to me"; "If I knew that I could never get caught, I would be willing to steal a million dollars", reversed). Finally, consistent with its theoretical basis of reactive (rather than active) cooperation, HEXACO agreeableness, or the tendency to be forgiving and lenient, was not related to dictator allocations in either frame.

#### 4.3. Limitations and Future Directions

One potential limitation in the current research is the relatively weaker manipulation of ownership across the two games, based on the arbitrary assignment at the start of the task. Although perceived ownership of the initial endowment in the giving game still exceeded that in the taking game, the difference in allocations between the two conditions were marginally significant, and this may have influenced any trait effects. A more powerful manipulation of ownership is to implement a prior production phase in which participants and their partners earn the points that they later give or take from [70]. A recent study using hypothetical scenarios describing a prior production phase reported results consistent with our hypotheses. Here, compassion, but not politeness, was associated with

greater “giving” in a variation of the dictator game where the participant had spent more time earning the endowment than their partner [65].

Another limitation concerns the fact that the personality measures and dictator game behaviors were measured within the same session, which may have artificially inflated any trait effects (e.g., if participants engaged in consistent reasoning). This would best be ruled out with a study design in which the two are separated in time. Nevertheless, there are several mitigating factors in the current study. First, the politeness and compassion items of the BFAS were embedded within 100 items measuring a variety of personality domains (e.g., “Believe in the importance of art”, “Laugh a lot”), thereby decreasing their salience. Furthermore, all conditions (including the neutrally-framed dictator game) were administered in a similar fashion within the same session, yet the correlation between HEXACO honesty-humility and standard dictator allocations ( $r = 0.29$ ) was on par with those in previous studies: both where the two had been separated in time (e.g.,  $r_s = 0.25, 0.27, 0.29$ ) [5,8,44] and collected together ( $r_s = 0.24, 0.27$ ) [71,72]; for an exception see [73]. These observations are in line with a wider literature showing that prosocial decisions are stable over time and can be consistently predicted by theoretically-relevant measures of personality [74,75].

While the current study focused on giving and taking in the dictator game, it is uncertain if the reported findings extend to all other forms of active cooperation. For example, the aversion to taking over the willingness to give appears to be reversed in the public goods game, where contributions were higher under a giving rather than taking frame [22,76]. Future research should examine which factors, such as situational cues and norms (e.g., taking from a “common resource” in the public goods game vs. taking from another’s private property in the dictator game), produce these disparities across different forms of active cooperation.

## 5. Conclusions

While it has yielded considerable evidence on unselfishness, inequality aversion, and other-regarding preferences, the standard dictator game models a narrow set of social interactions limited to the sharing of windfall money. Property ownership is a key parameter in many real-world transfers of wealth, with several studies showing that giving and taking are distinct processes each with its own set of social norms. Building on this in the current research, we found that allocations of wealth under giving and taking frames diverged with respect to prosocial personality traits. Overall, we observed stronger and more consistent Big Five trait effects in the taking than the giving game, suggesting that prosocial individuals were less willing to take from others due to an aversion to doing harm. Specifically, the compassion aspect of Big Five agreeableness uniquely predicted non-taking but not giving, while politeness no longer played a unique role when accounting for compassion. In contrast, HEXACO honesty-humility was strongly associated with greater allocations across both frames, in line with its broad association with non-exploitativeness and fair-mindedness and providing further evidence of its role in allocations of wealth. These findings are an important step in understanding how distinct prosocial personality traits are differentially manifested in behavior and help reveal the motives underpinning social decisions in economic games.

**Supplementary Materials:** The following are available online at <http://www.mdpi.com/2073-4336/9/2/30/s1>. The Supplementary Materials contain details of additional tasks and questionnaires that were included, but beyond the scope of the current research (Table S1), additional data for all personality variables from the Big Five model (Table S2), Tobit regression analysis of the results (Table S3), a description and summary of findings from a preliminary study examining the role of prosocial personality traits in a hypothetical giving-taking dictator game (Text S1, Tables S4, and S5), and a description and summary of findings from the post-decision questionnaire (Text S2, Table S6).

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## Appendix A. Instructions

### *Appendix A.1. General Instructions*

In this study, you will complete a series of decision-making tasks in which you will be asked to divide different amounts of money with another person. In each task, you will be matched with one or more people participating in this study. You will be matched with a different partner(s) each time.

Some of the tasks are interactive. That is, the final outcome depends on a combination of your decision and your matched partner's decision. In these tasks, you will be asked to indicate your response for each of your partner's decisions. At the end of the study, your decisions will be matched together.

One of the tasks has been selected and will be used to determine your bonus payment. This task will be revealed to you at the end of this study.

The money that you will be dividing in each task is represented by "points". At the end of the study, the bonus points that you earn will be converted into US dollars at the following rate: 1 point = US\$0.10.

### *Appendix A.2. Giving Game Instructions*

In the following task, participants are randomly assigned to one of two roles, Person A and Person B. Person A begins the task with 10 points and Person B begins the task with 0 points. Person A can choose to GIVE any of their points to Person B. Person B must accept whatever is chosen, that is, they do not have a say in this task. You have been assigned to the role of Person A. You will be matched with another participant who will be assigned to the role of Person B. The diagram below illustrates this task.

(See Figure 1)

What do you choose to do?

- Give 0 points to my partner (0)
- Give 1 point to my partner (1)
- Give 2 points to my partner (2)
- Give 3 points to my partner (3)
- Give 4 points to my partner (4)
- Give 5 points to my partner (5)
- Give 6 points to my partner (6)
- Give 7 points to my partner (7)
- Give 8 points to my partner (8)
- Give 9 points to my partner (9)
- Give 10 points to my partner (10)

### *Appendix A.3. Taking Game Instructions*

In the following task, participants are randomly assigned to one of two roles, Person A and Person B. Person A begins the task with 10 points and Person B begins the task with 0 points. Person B can choose to TAKE any points from Person A. Person A must accept whatever is chosen, that is, they do not have a say in this task. You have been assigned to the role of Person B. You will be matched with another participant who will be assigned to the role of Person A. The diagram below illustrates this task.

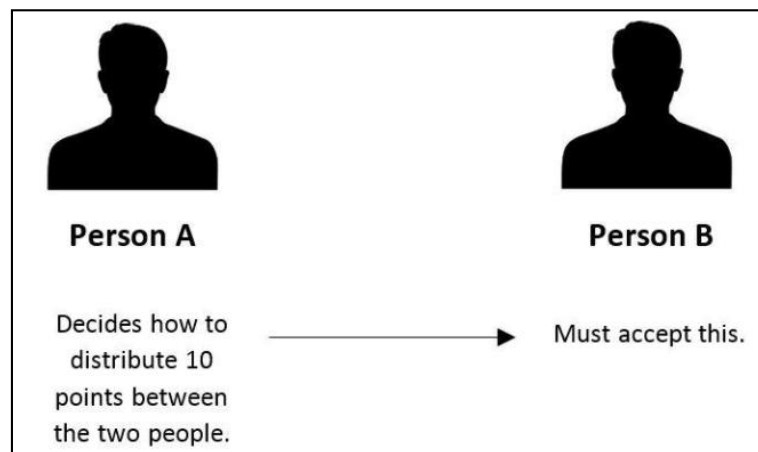
(See Figure 1)

What do you choose to do?

- Take 10 points from my partner (0)
- Take 9 points from my partner (1)
- Take 8 points from my partner (2)
- Take 7 points from my partner (3)
- Take 6 points from my partner (4)
- Take 5 points from my partner (5)
- Take 4 points from my partner (6)
- Take 3 points from my partner (7)
- Take 2 points from my partner (8)
- Take 1 point from my partner (9)
- Take 0 points from my partner (10)

*Appendix A.4. Neutrally-Framed Standard Game Instructions [59]*

In this task, you will be randomly matched with a new participant from this study. Remember, your identities are anonymous to each other and to the researcher. There are two roles, Person A and Person B. Person A receives 10 points and decides how to distribute it. Person B must accept this (see Figure A1).



**Figure A1.** Screenshot of visualization presented to participants in the standard dictator game.

You have been assigned to the role of Person A. Which of the following do you choose?

- 10 points for myself and 0 points for my partner (0)
- 9 points for myself and 1 points for my partner (1)
- 8 points for myself and 2 points for my partner (2)
- 7 points for myself and 3 points for my partner (3)
- 6 points for myself and 4 points for my partner (4)
- 5 points for myself and 5 points for my partner (5)
- 4 points for myself and 6 points for my partner (6)
- 3 points for myself and 7 points for my partner (7)
- 2 points for myself and 8 points for my partner (8)
- 1 points for myself and 9 points for my partner (9)
- 0 points for myself and 10 points for my partner (10)

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