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# **Positional Preferences and Narcissism: Evidence from “Money Burning” Dictator Games\***

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**Abstract**

We study the relationship between positional preferences (i.e., preferences concerning the relative rank or position in comparison to others) and narcissism. We distinguish two dimensions of narcissism: Narcissistic admiration captures self-enhancement through searching for being admired, and narcissistic rivalry captures self-defense through an antagonistic orientation toward others. We use six “money burning” mini-dictator games to measure positional preferences. Controlling for other relevant individual characteristics such as the Big Five personality traits and gender, we find evidence that narcissistic admiration is a negative predictor and narcissistic rivalry a positive predictor of positional preferences. We further find exploratory evidence that studying business or economics as a major (vs. minor) subject is associated with less positional preferences and that the relationships between narcissism and positional preferences are mediated by decision makers’ expectations with regard to other players’ choices.

*Keywords:* narcissism, narcissistic admiration, narcissistic rivalry, positional concerns, positional preferences, relative concerns

*JEL classification:* A12, A13, D01, D63

## 1. Introduction

People often do not only care about their own absolute payoffs but also about their relative standing as compared to others (e.g., Alpizar, Carlsson, and Johansson-Stenman 2005; Johansson-Stenman, Carlsson, and Daruvala 2002; Solnick and Hemenway 1998, 2005; Woo 2016). These “positional preferences” (Aronsson and Johansson-Stenman 2014; El Harbi et al. 2015)<sup>1</sup> may be associated with social costs (Charness and Grosskopf 2001; Charness and Rabin 2002) and might even make the decision makers themselves worse off in absolute terms (Bruhin, Fehr, and Schunk 2019; Dickinson and Masclet 2019; El Harbi et al. 2015; Sheskin, Bloom, and Wynn 2014). In our paper, we attempt to enhance our understanding of positional preferences by studying whether and how they are predicted by the decision maker’s narcissism, distinguishing between two different dimensions: narcissistic admiration and narcissistic rivalry.

Some literature has linked positional preferences with individual characteristics (Bogaerts and Pandelaere 2013; Bursztyn et al. 2017; Celse, Galia, and Max 2017; Charness and Grosskopf 2001; Clingingsmith and Sheremeta 2018; Friehe, Mechtel, and Pannenberg 2018; Lampi and Nordblom 2010; Pingle and Mitchell 2002; Schram, Brandts, and Gërxxhani 2018; Zhao, Ferguson, and Smillie 2016). However, none of these studies has investigated the relationship between positional preferences and narcissism. At the same time, narcissism has gained increasing attention in the economics literature (e.g., Aktas et al. 2016; Hoeft and Mill

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<sup>1</sup> Taken literally, the term “positional preferences” might also refer to the preference to be in a disadvantageous position compared to others and/or to *not* be in an advantageous position compared to others. However, in line with the literature, we use the term “positional preferences” for people’s preference to not be in a disadvantageous position and/or to be in an advantageous position (Aronsson and Johansson-Stenman 2014; El Harbi et al. 2015; see also the common use of related terms, such as “positionality” and “positional concerns”: Alpizar, Carlsson, and Johansson-Stenman 2005; Johansson-Stenman, Carlsson, and Daruvala 2002; Solnick and Hemenway 1998, 2005).

2017; Schröder et al. 2020; Yang et al. 2018). While it has been argued that narcissism positively relates to status seeking in terms of desiring to be highly respected by others (Zeigler-Hill et al. 2018), it is unclear whether narcissists will go as far to actively reduce others' payoffs to achieve a higher relative position.

Likewise, it is unclear whether positional preferences are differentially predicted by narcissistic admiration and narcissistic rivalry. These two constructs, which were originally introduced by Back et al. (2013), are associated with different forms of self-reported status seeking (Zeigler-Hill et al. 2018) and have been shown to have different behavioral implications in other contexts (Back et al. 2013; Wurst et al. 2017). But their link to positional preferences has not been analyzed as yet.

We contribute to the literature by linking experimentally revealed positional preferences with different dimensions of narcissism. With this approach, we seek to enhance the understanding of human decision making by combining the strengths of two methodologies: the measurement of revealed (and not merely stated) preferences with the help of an economic game experiment and a comprehensive, differentiated measurement of narcissism and its different dimensions that has been proposed and used in psychological literature. By distinguishing two different dimensions of narcissism, we go beyond previous economic studies that understand narcissism as a one-dimensional construct (e.g., Hoefft and Mill 2017; Yang et al. 2018). In addition, by linking positional preferences with narcissism as a personality trait, we follow the call for including personality measures in (experimental) economic research (Borghans et al. 2008; Schröder et al. 2020; Zhao and Smillie 2015).

Narcissism as a personality trait describes the tendency to perceive oneself (or to try to perceive oneself) as grandiose, superior, and entitled (Back et al. 2013; Brummelman et al. 2015; Paulhus and Williams, K. M. 2002). Specifically, *narcissistic admiration* refers to self-enhancement through searching for being admired, and *narcissistic rivalry* concerns self-

defense through an antagonistic orientation toward others (Back et al. 2013). We argue that narcissistic admiration is negatively associated with positional preferences, as individuals scoring high in this dimension of narcissism search for prestige and a great self-image, while we argue narcissistic rivalry to be positively associated with positional preferences, because this dimension of narcissism is associated with seeking dominance and a competitive mindset (Back et al. 2013; Zeigler-Hill et al. 2018).

To measure positional preferences, we use a game experiment with six mini-dictator games, building on previous research on dictator-type generosity games in behavioral economics (Bahr and Requate 2014; Charness and Grosskopf 2001; Charness and Rabin 2002; Güth 2010a; Güth, Levati, and Ploner 2012; Ito et al. 2016; Kahneman, Knetsch, and Thaler 1986; Klempt, Pull, and Stadler 2019). The games are played in a within-subjects design, which allows us to achieve a comprehensive measure of positional preferences for each individual. In each game, participants choose one of two possible payoff distributions between themselves and a second player: One payoff distribution represents a positional choice and one a non-positional choice. The positional choice increases the decision maker's relative position in comparison to the other player and thus indicates positional preferences. The own *absolute* payoff is never increased by making the positional choice, so that positional preferences are not confounded with pure self-interest. The “cost” of the positional choice is a lower efficiency in terms of a reduction in the total payoff of both players (see, e.g., Engelmann and Strobel 2004; Güth et al. 2010b for an analogous definition of efficiency) and—depending on the respective game—also includes a personal cost in terms of a lower own absolute payoff. Since efficiency is reduced and no monetary benefit for any player is created, making the positional choice is associated with “money burning” (Dickinson and Masclet 2019).

Controlling for other individual characteristics that have been found to be relevant for positional preferences, such as the Big Five personality traits, self-esteem, and gender

(Bursztyn et al. 2017; Anderson, Stahley, and Cullen 2014; Clingingsmith and Sheremeta 2018; Friehe, Mechtel, and Pannenberg 2018; Schram, Brandts, and Gërkhani 2018), we find evidence that narcissistic admiration is negatively associated with positional preferences, while narcissistic rivalry relates positively to positional preferences. We additionally find exploratory evidence that students majoring in business or economics have, on average, significantly less positional preferences (when these are distinguished from self-interest) than students who study business/economics only as a minor subject. Finally, we find exploratory evidence that the relationships between narcissism and positional preferences are mediated by decision makers' expectations with regard to other players' choices: Those with higher scores in narcissistic admiration expect others to make significantly fewer positional choices and those with higher scores in narcissistic rivalry expect others to make significantly more positional choices, and these expectations are significantly correlated with own choices.

The remainder of the paper is organized as follows. In Section 2, we develop our behavioral predictions concerning the link between positional preferences on the one hand and narcissistic admiration and narcissistic rivalry on the other. Section 3 describes the structure of the games, experimental procedures, variables, and sample. Section 4 presents the results, and Section 5 discusses the results and concludes.

## **2. Hypotheses: Narcissism and positional preferences**

We argue that the relationship between narcissism and positional preferences crucially depends on the dimension of narcissism that one refers to. While narcissistic admiration is the tendency to aim for greatness through being admired, narcissistic rivalry is the tendency to defend the self and to protect it from perceived threats that could lower the desired greatness (Back et al. 2013).

The construct of *narcissistic admiration* does not include negative attitudes toward other people. According to survey evidence, individuals scoring high in narcissistic admiration use

agentic strategies to gain status: They are prestige seeking (Zeigler-Hill et al. 2018) and try to “move upward” rather than “pulling superior others down” (Lange and Crusius 2015; see also Lange, Crusius, and Hagemeyer 2016).

Due to image concerns, these individuals may even have a motivation to refrain from choices that are detrimental to other individuals. Own generosity might here function as a means to keep or further boost a positive (self-)image. Several items on narcissistic admiration are related to image and image concerns, both with respect to grandiosity (e.g., “I deserve to be seen as a great personality”) and to charmingness (e.g., “I manage to be the center of attention with my outstanding contributions”) (Back et al. 2013: 1018). To maintain their grandiose self-view and self-image (“I am great”; Back et al. 2013: 1018), individuals with high scores in narcissistic admiration might avoid positional choices even in an anonymous setting. Therefore, we predict that narcissistic admiration is negatively associated with positional preferences.

**Hypothesis 1.** *Narcissistic admiration relates negatively to positional preferences.*

In contrast, a defining characteristic of *narcissistic rivalry* is defiance toward other individuals, so it can be expected that those scoring high in this dimension are often ready to create social damage. Survey evidence suggests that narcissistic rivalry is associated with an antagonistic orientation to status seeking: These individuals tend to search for dominance (Zeigler-Hill et al. 2018). As the construct of narcissistic rivalry describes a highly competitive mindset (e.g., “I want my rivals to fail”; Back et al. 2013: 1018), their goal should be a relatively higher position, rather than a great self-view in absolute terms. We therefore expect that narcissistic rivalry is positively associated with positional preferences.

**Hypothesis 2.** *Narcissistic rivalry relates positively to positional preferences.*



### 3. Method

#### 3.1 Mini-dictator games

To achieve a comprehensive measure of positional preferences, we employ six dictator games. Each of them is a mini-game with exactly two options for the decision maker (for the use of mini-games see also Bolton and Zwick 1995; Gale, Binmore, and Samuelson 1995). All games are dictator-type games, where two players are involved and where the second player, a mere recipient, cannot influence the outcome (Kahneman, Knetsch, and Thaler 1986). Compared to ultimatum games (Güth, Schmittberger, and Schwarze 1982), dictator games have the advantage that there is no strategic interaction between players, so that players' decisions reveal their preferences rather than reflecting strategic concerns (see Charness and Rabin 2002).

In each game, the decision maker chooses between one payoff distribution where her own payoff is smaller than or equal to that of the other player (no positional choice, i.e., positional choice = 0) and an alternative payoff distribution where her relative position in comparison to the other player is enhanced (positional choice = 1).

The first four games have a similar structure as the ones used in Charness and Grosskopf (2001: 306f.) and Sheskin, Bloom, and Wynn (2014). Games 1 and 2 measure whether inequality that is advantageous to the decision maker (advantageous inequality) is preferred over equality. Games 3 and 4 measure whether equality is preferred over inequality that is disadvantageous to the decision maker (disadvantageous inequality).

Games 5 and 6 measure whether advantageous inequality is preferred over disadvantageous inequality without an equal distribution option being available (compare Bruhin, Fehr, and Schunk 2019 for similar games).

The positional choice never increases the decision maker's payoff in absolute terms and is always the less efficient one in that the total payoff of both players is always smaller if the positional choice is made. Games 1, 3 and 5 are generosity games, where the decision maker's

payoff is fixed in advance and the positional choice does not affect the decision maker's payoff. In games 2, 4, and 6 the positional choice makes the decision maker even worse off in absolute terms. The different games are displayed in Table 1.

[TABLE 1 ABOUT HERE]

### **3.2 Experimental procedures**

All games are played by all participants in a within-subjects design. The order of the games and the order of the options in each game are randomized. The games are played anonymously, and participants are not allowed to interact with each other during the whole experiment and the subsequent personality assessment.

First, all participants make the six choices described in Section 3.1 from the perspective of the dictator. After the choices, the participants are asked to estimate how the whole group of participants has decided on average (for each game, participants are asked to estimate what the modal choice across all participants will be and what share of participants will opt for this choice). Finally, participants fill out a post-experimental questionnaire with personality assessments (narcissistic admiration and narcissistic rivalry, Big Five personality traits, and self-esteem) and other individual characteristics (study major, the semester in that major, age, and gender).

After the experiment and questionnaire, each player is randomly matched with another player. For each pair of players, one out of the twelve choices made by these two players (six by each player) is randomly chosen for actual payment. That is, even though every player acted in the role of the dictator in all six games, this role only became effective for one out of two players. Players are informed about this procedure before making their choices and know that they receive the payment for only one game, so that wealth effects are ruled out.

In addition, participants can receive a “bonus payment” for a correct expectation concerning the prevalence of positional choices of all participants in the experiment (1 euro for the correct

estimation of the modal choice; and 1 euro for a sufficiently precise estimation of the percentage of this choice, if it is at most 10 percentage points different from the actual share). For each participant, one of the six games is randomly chosen for the bonus payment, and the participant's expectations with regard to this game are paid out (total bonus payment of at most 2 euros). The participants are informed about this procedure before they report their estimations.

When the participants make their game choices, provide estimations concerning the choices of others, and fill out the post-experimental questionnaire, they do not know what payoff they will receive or with which player they will be matched. In this way, a possible role of reciprocity in the game choices (that is, responding to the choice of the respective other player) and a possible influence of game outcomes on the responses in the personality questionnaire are avoided.

The complete instructions are presented in Appendix B.

### **3.3 Variables**

We use the sum score of positional choices in all of the six mini-dictator games as a comprehensive measure of revealed positional preferences, arguing that the number of positional choices an individual makes (0 to 6) indicates the extent to which the individual is characterized by positional preferences. However, for more detailed insights we also look at the positional choices in each of the six games.

The personality traits are assessed in the following way. Narcissistic admiration and narcissistic rivalry are assessed with the Narcissistic Admiration and Rivalry Questionnaire (NARQ) (Back et al. 2013), which consists of 18 items on a Likert scale from 1 to 6. Nine of these items measure narcissistic admiration by asking the individuals as how great and special they perceive themselves; this measure includes three items for grandiosity (e.g., "I am great"), three items for uniqueness (e.g., "I show others how special I am"), and three items for

charmingness (e.g., “I manage to be the center of attention with my outstanding contributions”) (Back et al. 2013: 1018). The other nine items measure narcissistic rivalry by asking individuals about their attitude toward others; this measure includes three items for devaluation (e.g., “Most people won’t achieve anything”), three items for supremacy (e.g., “I secretly take pleasure in the failure of my rivals”), and three items for aggressiveness (e.g., “I react annoyed if another person steals the show from me”) (Back et al. 2013: 1018). The NARQ is a validated measure of narcissism (Back et al. 2013; Grosz et al. 2017). Compared to other measures such as the Narcissistic Personality Inventory (NPI) (Raskin, R. N. and Hall 1979; Raskin, R. and Terry 1988), the NARQ has the advantage that it distinguishes two different dimensions of narcissism, which is highly relevant for the purpose of this study. The—validated—German version of the NARQ is used (Back et al. 2013: 1018).

The Big Five personality traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism are assessed with the—validated—short German Socio-Economic Panel (GSOEP) Big Five Inventory (Gerlitz and Schupp 2005).

Self-esteem is assessed with the validated and widely used Rosenberg Self-Esteem Scale (RSES) (Rosenberg 1965; see Gray-Little, Williams, and Hancock 1997). As a German translation, a revised and validated version of the German scale by Ferring and Filipp (1996) is used (Von Collani and Herzberg 2003).

Each personality trait is calculated as the average score of the respective items. Items are recoded beforehand, if necessary, so that larger numbers always correspond to higher values on a trait. Each personality variable is z-standardized for the analysis, so that each has the mean 0 and a standard deviation of 1.

### **3.4 Sample**

The experiment was conducted in paper-and-pencil form as a voluntary part of a university lecture in the classroom. The lecture was on labor, human resource management, and

organization for undergraduate students at the University of Tübingen in Germany. All of the participants studied business and/or economics as a major or minor subject. The experiment was implemented on April 24, 2017.

The participants were explicitly asked to fill out all forms independently of the other participants and to not communicate with others. The implementation was closely monitored by several observers, and we had no indication that participants communicated with each other or observed the choices of other participants. Because the order of games was randomized, it would also have been difficult for participants to observe the game choices of others with a fast look.

The sample consists of  $N = 192$  participants who made all choices in the six games and filled out the whole post-experimental questionnaire. The average age in the sample is 22.0 years (standard deviation = 2.2 years, minimum 19, maximum 33 years), 59.9% of participants are female. Of all participants, 64.6% have a business and/or economics major, while the others have another study major (and study business/economics only as a minor subject). Participants are on average in semester 4.5 in their major subject (standard deviation = 1.9, min. 2, max. 12).

## **4. Results**

### **4.1 Descriptive statistics and correlations**

Figure 1 displays the shares of positional choices in the different games together with 95% confidence intervals. Only a small percentage of individuals prefers advantageous inequality over equality (games 1 and 2), while a larger percentage prefers equality over disadvantageous inequality (game 3 respectively game 4), and these differences are statistically significant, as revealed by a McNemar chi-squared test ( $p < .01$ ). This pattern is in line with previous research (Charness and Grosskopf 2001: 310). In the games where there is no equal distribution option

(games 5 and 6), the overall percentages of positional choices (i.e., preferring advantageous inequality over disadvantageous inequality) are significantly larger than in game 1 respectively game 2 ( $p < .01$ ), where the choice was between advantageous inequality (= positional choice) and equality, and significantly smaller than in game 3 ( $p < .01$ ) respectively game 4 ( $p < .05$ ), where the choice was between equality (= positional choice) and disadvantageous inequality. Generally, positional choices are less often made when they are associated with own costs: in particular, game 4 versus game 3 and game 6 versus game 5 ( $p < .01$ ); not significant for game 2 versus game 1.

Descriptive statistics of all variables are shown in Table A1 in the Appendix. Narcissism is measured with a high internal consistency as indicated by Cronbach's alpha values of 0.84 (narcissistic admiration) and 0.80 (narcissistic rivalry).

[FIGURE 1 ABOUT HERE]

Correlations between all variables are shown in Table A2 in the Appendix. Positional choices in the different games are all significantly positively correlated: An individual that makes a positional choice in one game is more likely to make a positional choice in another game. This indicates that positional preferences may be regarded as one construct and justifies the use of a sum score as a comprehensive measure of positional preferences. The internal consistency of the measure, using all six games and expressed by Cronbach's alpha, is sufficiently high (0.79).<sup>2</sup>

Because some explanatory variables are correlated with each other, we test for multicollinearity by calculating variance inflation factors (VIF) with the full model used in

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<sup>2</sup> We also perform a factor analysis (iterated principal-factor analysis) of the six game choices to explore empirical patterns of behavior. Following the convention, we retain factors with an eigenvalue of at least 1. The factor analysis yields exactly one factor that captures positional choices across all games. This further supports the idea that positional preferences can be regarded as one construct.

Section 4.2 below. All individual characteristics—narcissistic admiration, narcissistic rivalry, the Big Five personality traits, self-esteem, business/economics major, female, and age—have VIF values below 3. This indicates that multicollinearity is not a major concern.

## 4.2 Narcissism and positional preferences

Model (1) of Table 2 presents the results of the hypotheses tests, using the sum of positional choices across games as the dependent variable. We apply an ordinary least squares regression to estimate how narcissistic admiration and narcissistic rivalry relate to positional choices when holding other individual characteristics constant. The model has the following form:

$$P_i = b_0 + b_1 * NA_i + b_2 * NR_i + b_3 * C_i + e_i,$$

where  $i$  is the individual,  $P_i$  is the sum of positional choices made by  $i$ ,  $NA_i$  is  $i$ 's score in narcissistic admiration,  $NR_i$  is  $i$ 's score in narcissistic rivalry,  $C_i$  is a vector of the control variables (with  $b_3$  being a vector of the respective coefficients), and  $e_i$  is the error term. By including both narcissistic admiration and narcissistic rivalry in the model, we investigate the isolated effects of each of these dimensions (see Back et al. 2013; Fatfouta, Rentzsch, and Schröder-Abé 2018 for a similar procedure). We control for the Big Five personality traits and self-esteem, so that we test whether narcissism explains positional preferences beyond these factors, which have been found to be relevant for positional preferences (Bursztyrn et al. 2017; Friehe, Mechtel, and Pannenberg 2018). We further control for the study major (where we distinguish the two main groups: business/economics as a major subject and business/economics as a minor subject), gender, and age. In addition, the position of each game in the questionnaire and the order of the two options in each game are included as control variables. Heteroscedasticity-robust standard errors are used, because the assumption of homoscedasticity is rejected with a Breusch-Pagan / Cook-Weisberg test ( $p < .01$ ).

In line with Hypothesis 1, narcissistic admiration relates negatively to positional preferences, as measured by the sum score of positional choices across all six games (see model (1) of Table 2). A higher value in narcissistic admiration by one unit (i.e., one standard deviation) is associated with 0.42 fewer positional choices, on average, when the other individual characteristics are held constant. The standardized effect size (Cohen's  $d$ ), calculated by dividing the coefficient by the standard deviation of the dependent variable (1.64), amounts to  $-0.26$ .

As predicted by Hypothesis 2, narcissistic rivalry is positively associated with positional preferences. A higher value in narcissistic rivalry by one standard deviation is associated with 0.50 more positional choices, on average, holding the other individual characteristics constant. The standardized effect size amounts to  $d = 0.31$ .

We note that the Big Five personality traits, self-esteem, and gender do not show significant relationships with our measure of positional preferences, except for a marginally significant positive association with extraversion. This is a difference to previous literature that found conscientiousness and agreeableness to relate negatively and neuroticism to relate positively to (survey-assessed) positional preferences (Friehe et al., 2018). We also do not find a relationship between self-esteem or gender and positional preferences, although such relationships might be expected based on previous evidence on preferences for status goods (Bursztyn et al. 2017; Clingingsmith and Sheremeta 2018; Schram, Brandts, and Gërkhani 2018). One reason for the deviation of results might be that we measure revealed positional preferences by observing choice behavior in a set of experimental games while previous literature uses either survey-



based measures for positional choices or related but not identical constructs such as status seeking (which does not imply the readiness to actively reduce others' payoffs).<sup>3</sup>

As shown by Table 2, studying business/economics as major (as opposed to minor) subject is negatively related to positional preferences.<sup>4</sup> This effect is not (fully) explained by the fact that narcissism and other personality traits are held constant: Even if no control variables are included, business/economics is significantly negatively related to the sum of positional choices (see Table A2 in the Appendix). At first glance, these results may seem surprising, since it has been found that business and economics students have higher average values of self-interest, especially due to (self-)selection into the field (Bauman and Rose, E. 2011; Cadsby and Maynes 1998; Mertins and Warning 2014). However, in our games, positional choices are not in the decision maker's self-interest, as they do not increase (and in some games even decrease) the decision maker's payoff. We thus find exploratory evidence that studying business or economics as a major subject is related to less positional preferences—provided that these are distinctively measured from and not confounded with self-interest.

We complement our analysis of the sum score of positional choices as a comprehensive measure of positional preferences by a set of probit regressions that use the choice in each different game (1 = positional choice, 0 = no positional choice) as the dependent variable (see models (2)–(7) of Table 2). This allows us to see whether our results on the sum score are driven by the positional choices in certain games. We present average marginal effects, that is, the coefficients estimate how the probability of making the positional choice in a specific game

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<sup>3</sup> The reason is not the inclusion of narcissism, since we find that the Big Five personality traits, self-esteem, and gender do not show significant effects on the sum score of positional choices even if the measures of narcissism are dropped from the model.

<sup>4</sup> Of the students in our sample, 5.2% have a business and/or economics major and additionally one other major. They are counted as business/economics majors. If they are not included in the analysis, then the result for business/economics major as presented in model (1) of Table 2 does not change.

changes on average if a certain explanatory variable increases by one unit (standard deviation), holding the other factors constant.

For narcissistic admiration, it turns out that the point estimates are negative for positional choices in each game, but the effect is significant only in game 1 and marginally significant in games 2, 4, and 5. For narcissistic rivalry, the point estimates are positive in each game, but the results are significant only in games 1 and 5 and marginally significant in game 6.

[TABLE 2 ABOUT HERE]

### 4.3 Robustness checks

We perform several additional estimations to check the robustness of our main results. As the detailed results of the robustness checks in Table A3 in the Appendix show, our results are by and large qualitatively robust, especially for narcissistic rivalry.

First, making the positional choice when this choice is associated with a personal cost to the decision maker may be seen as stronger and more robust evidence of positional preferences than making the positional choice when this choice is cost-free for the decision maker. Therefore, we distinguish two specifications of the sum score: one that only considers games in which the payoff of the decision maker is fixed (games 1, 3, and 5) and one that only considers games in which the positional choice is associated with a smaller absolute payoff for the decision maker than the alternative choice (games 2, 4, and 6). In both cases, narcissistic admiration is a negative predictor of positional choices, while narcissistic rivalry is a positive predictor; however, the effect of narcissistic rivalry is only marginally significant for games with personal cost. (See models (1)–(2) of Table A3.)

The inclusion of additional personality variables beyond narcissism (Big Five personality traits and self-esteem) might create suppressor effects (Paulhus et al. 2004), because these variables are (weakly to moderately) correlated with narcissism (see Table A2 in the Appendix). Therefore, we perform a second robustness check, where the Big Five personality

traits and self-esteem are not included in the model (predicting the sum of positional choices across all games). The point estimate for the effect of narcissistic admiration remains negative and the estimate for narcissistic rivalry remains positive, but the estimated effect sizes and their statistical significance decrease. The association of narcissistic rivalry with positional choices is marginally significant in this analysis. (See model (3) of Table A3.)

Lastly, because the two narcissism measures are positively correlated with each other (see Table A2 in the Appendix), we use separate regressions for the narcissism dimensions in which the respective other measure is dropped from the model (sum score of positional choices); all other explanatory variables are included. If narcissistic rivalry is dropped, then the coefficient for narcissistic admiration is still estimated to be negative but not statistically significant. If narcissistic admiration is dropped, then the estimated coefficient for narcissistic rivalry is still estimated to be positive (with a smaller coefficient than in the full model) and marginally significant. (See models (4)–(5) of Table A3.)

#### **4.4 Exploratory analysis: The role of expectations**

As the participants were also asked which choices they expect from the other participants (modal choice in each game and the share of participants who make a certain choice), we can use these data to explore the links between narcissism, expectations, and choices. Because participants receive a bonus payment for sufficiently precise estimations (see Section 3.2), they have an incentive to be accurate and therefore to report what they actually believe is true.

On average, participants expect positional preferences to be more prevalent than they actually are: Across all six games, participants expect a sum of 2.21 positional choices per participant, on average, while the actual number of positional choices across the six games is 1.29, on average (see Table A1 in the Appendix). This difference is statistically significant, as a McNemar chi-squared test reveals ( $p < .01$ ). For each game, the expected share of positional

choices is significantly larger than the actual share ( $p < .01$ ). These results are consistent with survey evidence by Johansson-Stenman and Martinsson (2006).

We find that narcissistic admiration is negatively related to the expectation of positional choices, while narcissistic rivalry is positively related to expected positional choices: Controlling for the other explanatory variables, a higher value in narcissistic admiration by one unit (standard deviation) is associated with 0.31 fewer expected positional choices across the six games, while a higher value in narcissistic rivalry by one standard deviation is associated with 0.36 more expected positional choices across games (each  $p < .05$ ). There are also some significant effects in the same directions for the expected shares of positional choices in specific games (see Table A4 in the Appendix for the detailed results).

Expectations mediate the relationships between narcissism and positional choices if they also influence the decision makers' own choices and if the inclusion of expectations in the model changes (reduces) the effect of narcissism on positional choices. In order to explore such a mediation effect, we include the expected positional choices as additional predictors in the models explaining positional choices. We find that expected positional choices are strongly positively related to own positional choices: Those who expect others to make one more positional choice across the six games tend to make 1.08 more positional choices themselves ( $p < .01$ ). When expectations are held constant, the associations of narcissistic admiration and narcissistic rivalry with the sum score of positional choices become insignificant (although the point estimates keep their directions). For each separate game, higher expectations of positional choices are associated with a significantly higher probability to make a positional choice, and the effects of narcissistic admiration and narcissistic rivalry are mostly insignificant when the expectations are included (see Table A5 in the Appendix for the detailed results).

Overall, our exploratory investigation speaks in favor of a strong mediation effect—almost a full mediation—in the sense that higher expectations of positional choices explain why those

scoring higher in narcissistic admiration tend to make less positional choices and those scoring higher in narcissistic rivalry tend to make more positional choices. Figure 2 visualizes the results of the mediation analysis, focusing on the (actual respectively expected) sum score of positional choices across games.

[FIGURE 2 ABOUT HERE]

We note that the results of our exploratory investigation are to be interpreted with caution since we elicited participants' expectations *after* the choices had been made, so that—even though they were incentivized—expectations might have been stated to justify own decisions.

## 5. Discussion and conclusion

Our study adds to our understanding on basic behavioral motives by investigating the relationship between positional preferences and narcissism. Across six mini-dictator games, we find evidence that narcissistic admiration is a negative predictor and narcissistic rivalry is a positive predictor of positional preferences, holding other individual characteristics constant. The results indicate that striving for being admired, for a grandiose self-view or self-image, is negatively related to positional preferences, while the desire to protect the self from perceived threats and to maintain or achieve a superior self-view is positively related to positional preferences.

As every study, our study does have limitations. Specifically, our study might suffer from a common method bias (e.g., Antonakis et al. 2010), because game behavior and narcissism were evaluated at the same time. The current mood, for example, could theoretically affect both the dependent and the explanatory variables, leading to spurious associations that are not robust. However, we note that personality traits, although they develop over the lifespan, are relatively stable constructs (see in particular the high temporal consistency of narcissistic admiration and rivalry, as found in Back et al. 2013: 1018f.), so we think this risk is not too high. Nevertheless,

future research might increase the time distance between the measurements of positional preferences and personality traits or find other ways of assessing personality.

Likewise, future research might build on a design where participants are *ex ante* allocated to the two different roles (decision maker vs. recipient) and where only those that know they are allocated to the role of the decision maker are then asked to make a choice. Our design in which all participants decide in the role of the decision maker offers the benefit of a larger sample size, but as participants know they have a 50% chance to end up as recipients, their expectations with regard to other players' choices might affect their own choices. While our exploratory analysis on the role of expectations (see Section 4.4) renders support for this potential transmission channel, future studies might want to dig deeper into the mechanisms that drive the links between narcissism and positional preferences.

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**Table 1: Mini-dictator games used in the present study**

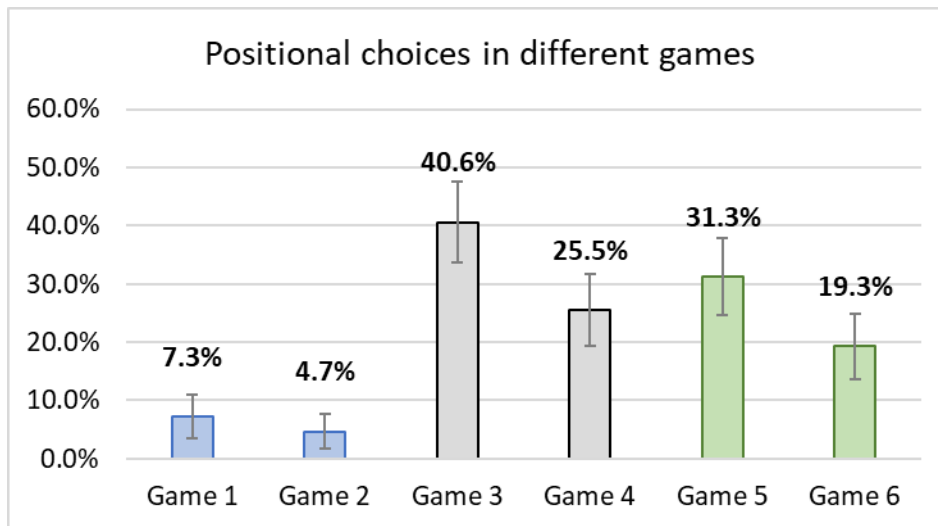
Game number	Category	No positional choice (0)		Positional choice (1)	
		Own payoff in €	Other player's payoff in €	Own payoff in €	Other player's payoff in €
1	Advantageous inequality	10	10	10	5
2	(1) vs. equality (0)	10	10	9	5
3	Equality (1)	5	10	5	5
4	vs. disadvantageous inequality (0)	5	10	4	4
5	Advantageous (1)	8	10	8	6
6	vs. disadvantageous inequality (0)	8	10	7	5

*Notes:* This table presents the structure of the games in the present study. 1 euro (€) corresponds to about \$1.09 at the time of the experiment.

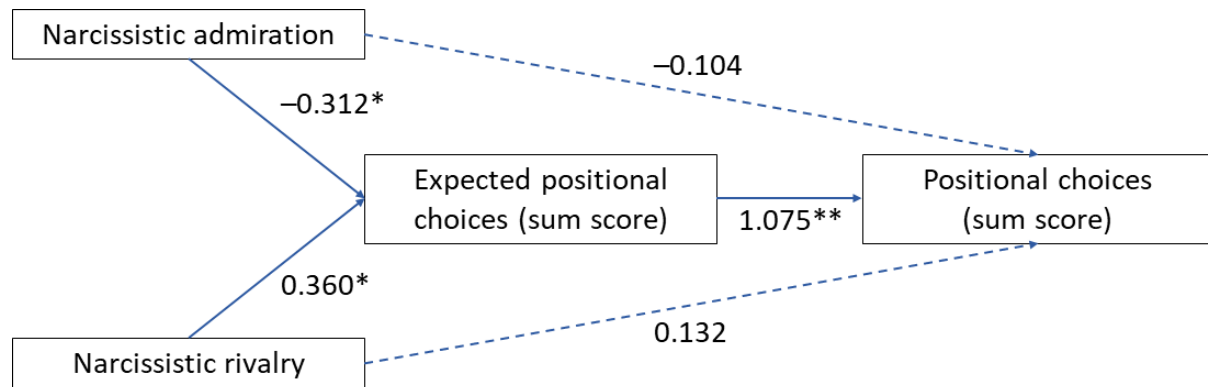
**Table 2: Narcissism and positional choices (sum score and different games)**

	(1) Positional choices (sum score)	(2) Positional choice in game 1	(3) Positional choice in game 2	(4) Positional choice in game 3	(5) Positional choice in game 4	(6) Positional choice in game 5	(7) Positional choice in game 6
Narcissistic admiration	-0.423* (0.183)	-0.060* (0.024)	-0.039+ (0.021)	-0.086 (0.054)	-0.094+ (0.048)	-0.086+ (0.049)	-0.073 (0.047)
Narcissistic rivalry	0.501** (0.187)	0.091** (0.024)	0.032 (0.022)	0.058 (0.051)	0.058 (0.046)	0.163** (0.047)	0.077+ (0.045)
Openness	0.091 (0.117)	0.017 (0.018)	0.011 (0.016)	0.046 (0.036)	0.032 (0.030)	-0.004 (0.034)	-0.015 (0.032)
Conscientiousness	0.102 (0.134)	0.010 (0.015)	0.028+ (0.015)	0.010 (0.038)	0.020 (0.033)	0.020 (0.035)	0.003 (0.031)
Extraversion	0.228+ (0.130)	0.063** (0.020)	0.047** (0.016)	0.021 (0.038)	0.012 (0.033)	0.035 (0.035)	0.061+ (0.033)
Agreeableness	0.101 (0.130)	-0.001 (0.016)	-0.002 (0.013)	0.037 (0.037)	0.042 (0.031)	0.001 (0.033)	0.016 (0.030)
Neuroticism	0.076 (0.130)	-0.013 (0.017)	-0.001 (0.013)	0.014 (0.042)	0.037 (0.036)	-0.002 (0.038)	0.014 (0.033)
Self-esteem	0.220 (0.167)	0.021 (0.020)	-0.001 (0.017)	0.030 (0.049)	0.066+ (0.040)	0.058 (0.047)	0.047 (0.039)
Business/economics major	-0.619* (0.253)	-0.057+ (0.034)	-0.004 (0.028)	-0.131+ (0.072)	-0.171** (0.059)	-0.133* (0.064)	-0.096+ (0.057)
Female	0.236 (0.293)	-0.062+ (0.034)	-0.021 (0.023)	0.098 (0.086)	0.012 (0.075)	0.170* (0.080)	0.009 (0.065)
Age	0.108 (0.068)	0.013+ (0.007)	0.014** (0.005)	0.013 (0.017)	0.002 (0.015)	0.019 (0.014)	0.014 (0.013)
Constant	-5.622 (3.551)						
Observations	192	192	192	192	192	192	192
(Pseudo) R-squared	0.159	0.327	0.293	0.057	0.105	0.109	0.059

*Notes:* Model (1): OLS regression. Models (2)–(7): probit models, average marginal effects. All personality variables are z-standardized. Robust standard errors in parentheses. \*\* $p < .01$ . \* $p < .05$ . + $p < .10$ .



**Figure 1.** Shares of positional choices in the different games, with 95% confidence intervals.



**Figure 2.** Mediation analysis with expectations of positional choices. Coefficients from OLS regressions. The variable “Expected positional choices (sum score)” denotes the aggregate number of expected positional choices per participant over the six games (scale from 0 to 6). All personality variables are z-standardized.  $^{**}p < .01$ .  $^*p < .05$ .  $+p < .10$ .



## **Appendix**

Appendix A) Supplementary results .....	33
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## Appendix A) Supplementary results

**Table A1: Descriptive statistics**

Variables	Operationalization	Mean	SD
Dependent variables: choices			
Positional choices (sum score)	Number of positional choices across all games	1.286	1.636
Positional choice in game 1	1 = positional choice, 0 otherwise	0.073	0.261
Positional choice in game 2	1 = positional choice, 0 otherwise	0.047	0.212
Positional choice in game 3	1 = positional choice, 0 otherwise	0.406	0.492
Positional choice in game 4	1 = positional choice, 0 otherwise	0.255	0.437
Positional choice in game 5	1 = positional choice, 0 otherwise	0.313	0.465
Positional choice in game 6	1 = positional choice, 0 otherwise	0.193	0.395
Explanatory variables			
Narcissistic admiration	Average over 9 items, scale from 1 to 6	3.181	0.797
Narcissistic rivalry	Average over 9 items, scale from 1 to 6	2.165	0.733
Openness	Average over 3 items, scale from 1 to 7	4.573	1.158
Conscientiousness	Average over 3 items, scale from 1 to 7	5.012	0.991
Extraversion	Average over 3 items, scale from 1 to 7	4.762	1.237
Agreeableness	Average over 3 items, scale from 1 to 7	5.285	0.849
Neuroticism	Average over 3 items, scale from 1 to 7	4.295	1.344
Self-esteem	Average over 10 items, scale from 0 to 3	2.260	0.515
Business/economics major	1 = business/economics major, 0 otherwise	0.646	0.480
Female	1 = female, 0 = male	0.599	0.491
Age	In years	21.953	2.162
<i>N</i>	192		

*Notes:* SD = standard deviation.

**Table A2: Correlations**

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Positional choices (sum score)	1.00																
2 Positional choice in game 1	.54**	1.00															
3 Positional choice in game 2	.53**	.51**	1.00														
4 Positional choice in game 3	.81**	.30**	.27**	1.00													
5 Positional choice in game 4	.78**	.20**	.32**	.54**	1.00												
6 Positional choice in game 5	.80**	.42**	.22**	.68**	.51**	1.00											
7 Positional choice in game 6	.68**	.22**	.39**	.38**	.56**	.33**	1.00										
8 Narcissistic admiration	-.08	.09	-.02	-.13+	-.12+	-.04	-.06	1.00									
9 Narcissistic rivalry	.05	.15*	.03	-.05	-.04	.15*	.02	.51**	1.00								
10 Openness	.04	.05	.02	.07	.04	.01	-.03	.24**	.09	1.00							
11 Conscientiousness	.06	.02	.09	.05	.07	.04	.00	-.05	-.12	-.02	1.00						
12 Extraversion	.03	.12+	.12+	-.02	-.02	-.03	.07	.23**	-.24**	.12	.07	1.00					
13 Agreeableness	.03	-.05	-.01	.08	.10	-.06	.02	-.01	-.28**	.05	.22**	.07	1.00				
14 Neuroticism	.04	-.06	-.01	.06	.05	.06	.01	-.17*	.18*	.04	.03	-.31**	.02	1.00			
15 Self-esteem	.00	.06	-.00	-.04	.02	-.03	.03	.35**	-.22**	-.03	.20**	.35**	.22**	-.52**	1.00		
16 Business/econ. major	-.17*	-.09	.01	-.14+	-.19**	-.14+	-.11	.10	.05	-.02	.14+	.12	.03	.03	.09	1.00	
17 Female	.10	-.14+	-.02	.16*	.11	.14+	.02	-.42**	-.30**	.09	.28**	.01	.11	.26**	-.19**	-.07	1.00
18 Age	.12+	.15*	.19**	.06	.02	.09	.09	-.06	.01	.05	-.18*	-.05	-.08	.12	-.11	-.10	-.09

Notes:  $N = 192$ . \*\* $p < .01$ . \* $p < .05$ . + $p < .10$ .

**Table A3: Robustness checks**

	(1) Positional choices (sum score) in games without personal cost (games 1, 3, 5)	(2) Positional choices (sum score) in games with personal cost (games 2, 4, 6)	(3) Positional choices (sum score) without Big Five traits and self-esteem	(4) Positional choices (sum score) without narcissistic rivalry	(5) Positional choices (sum score) without narcissistic admiration
Narcissistic admiration	-0.218* (0.103)	-0.205* (0.102)	-0.149 (0.137)	-0.098 (0.155)	
Narcissistic rivalry	0.318** (0.103)	0.183+ (0.105)	0.256+ (0.152)		0.257+ (0.149)
Openness	0.065 (0.069)	0.027 (0.063)		0.069 (0.120)	0.008 (0.111)
Conscientiousness	0.039 (0.077)	0.062 (0.074)		0.131 (0.148)	0.119 (0.136)
Extraversion	0.091 (0.079)	0.137* (0.067)		0.098 (0.127)	0.129 (0.126)
Agreeableness	0.037 (0.081)	0.064 (0.066)		0.010 (0.126)	0.075 (0.132)
Neuroticism	0.018 (0.081)	0.058 (0.068)		0.118 (0.138)	0.060 (0.132)
Self-esteem	0.118 (0.103)	0.102 (0.090)		0.069 (0.163)	0.065 (0.146)
Business/economics major	-0.320* (0.153)	-0.299* (0.136)	-0.503* (0.247)	-0.599* (0.259)	-0.623* (0.254)
Female	0.239 (0.182)	-0.003 (0.150)	0.372 (0.265)	0.129 (0.307)	0.418 (0.280)
Age	0.057 (0.039)	0.051 (0.035)	0.098 (0.074)	0.104 (0.070)	0.118+ (0.069)
Constant	-1.874 (2.350)	-3.749* (1.771)	-5.592 (3.728)	-5.844 (3.582)	-6.244+ (3.649)
Observations	192	192	192	192	192
R-squared	0.155	0.133	0.122	0.118	0.133

*Notes:* OLS regressions. In model (1), the dependent variable is the sum of positional choices in the games in which the payoff of the decision maker is fixed (games 1, 3, and 5; the other games are not considered). In model (2), the dependent variable is the sum of positional choices in the games in which the positional choice is associated with a personal cost to the decision maker (i.e., only considering games 2, 4, and 6). In models (3)–(5), the dependent variable is the sum of positional choices in all six games. All personality variables are z-standardized. Robust standard errors in parentheses. \*\* $p < .01$ . \* $p < .05$ . + $p < .10$ .

**Table A4: Exploratory analysis: Narcissism and expected shares of positional choices**

Variables	(1) Expected positional choices (sum score)	(2) Expected positional choices in game 1	(3) Expected positional choices in game 2	(4) Expected positional choices in game 3	(5) Expected positional choices in game 4	(6) Expected positional choices in game 5	(7) Expected positional choices in game 6
Narcissistic admiration	-0.312* (0.142)	-0.048 (0.031)	-0.012 (0.027)	-0.076* (0.030)	-0.045 (0.034)	-0.087** (0.030)	-0.053+ (0.029)
Narcissistic rivalry	0.360* (0.141)	0.075** (0.028)	0.014 (0.024)	0.067* (0.029)	0.044 (0.034)	0.101** (0.029)	0.042 (0.033)
Openness	0.080 (0.083)	-0.015 (0.019)	0.004 (0.013)	0.028 (0.020)	0.029 (0.019)	0.030 (0.018)	0.001 (0.019)
Conscientiousness	0.066 (0.081)	0.017 (0.016)	-0.003 (0.015)	0.019 (0.020)	-0.005 (0.020)	0.015 (0.020)	-0.001 (0.019)
Extraversion	0.125 (0.086)	0.030+ (0.017)	-0.009 (0.013)	0.030 (0.020)	0.006 (0.021)	0.024 (0.018)	0.019 (0.020)
Agreeableness	0.206* (0.081)	0.048** (0.017)	0.008 (0.013)	0.041* (0.018)	0.033+ (0.020)	0.050** (0.019)	0.024 (0.018)
Neuroticism	0.024 (0.098)	-0.008 (0.020)	-0.012 (0.015)	0.006 (0.022)	0.014 (0.024)	-0.010 (0.022)	0.027 (0.022)
Self-esteem	0.098 (0.109)	0.017 (0.023)	-0.003 (0.020)	0.027 (0.025)	0.026 (0.027)	0.033 (0.026)	0.016 (0.026)
Business/economics major	-0.557** (0.182)	-0.060 (0.037)	-0.073* (0.031)	-0.094* (0.038)	-0.128** (0.042)	-0.075+ (0.038)	-0.086* (0.039)
Female	0.423* (0.211)	0.034 (0.041)	0.016 (0.028)	0.108* (0.048)	0.092+ (0.050)	0.091+ (0.049)	0.060 (0.048)
Age	0.052 (0.041)	0.003 (0.008)	0.010 (0.007)	0.007 (0.009)	0.008 (0.011)	0.006 (0.009)	0.007 (0.009)
Constant	-1.287 (2.540)	0.191 (0.196)	0.005 (0.167)	0.371+ (0.211)	0.197 (0.252)	0.308 (0.209)	0.182 (0.207)
Observations	189	189	189	189	189	189	189
R-squared	0.218	0.110	0.089	0.185	0.140	0.176	0.120

*Notes:* OLS regressions. In model (1), the dependent variable is the aggregate number of expected positional choices over the six games (sum of the following six variables, scale from 0 to 6). In models (2)–(7), the dependent variable is the expected share of positional choices made in the respective game (expected by the decision maker). All personality variables are z-standardized. Robust standard errors in parentheses. \*\* $p < .01$ . \* $p < .05$ . + $p < .10$ .

**Table A5: Exploratory analysis: Narcissism, expectations, and positional choices**

Variables	(1) Positional choices (sum score)	(2) Positional choice in game 1	(3) Positional choice in game 2	(4) Positional choice in game 3	(5) Positional choice in game 4	(6) Positional choice in game 5	(7) Positional choice in game 6
Expected positional choices (sum score)	1.075** (0.082)						
Expected positional choices in game 1		0.292** (0.050)					
Expected positional choices in game 2			0.223** (0.065)				
Expected positional choices in game 3				1.158** (0.062)			
Expected positional choices in game 4					0.744** (0.051)		
Expected positional choices in game 5						0.923** (0.080)	
Expected positional choices in game 6							0.590** (0.073)
Narcissistic admiration	-0.104 (0.127)	-0.067** (0.025)	-0.031+ (0.016)	0.008 (0.043)	-0.059+ (0.032)	0.013 (0.039)	-0.029 (0.036)
Narcissistic rivalry	0.132 (0.126)	0.081** (0.025)	0.021 (0.016)	-0.033 (0.038)	0.020 (0.032)	0.067 (0.046)	0.044 (0.034)
Openness	-0.001 (0.089)	0.023 (0.016)	0.014 (0.011)	0.013 (0.030)	0.002 (0.023)	-0.039 (0.030)	-0.024 (0.030)
Conscientiousness	0.029 (0.090)	-0.016 (0.014)	0.022* (0.011)	-0.013 (0.026)	0.009 (0.024)	0.003 (0.030)	0.002 (0.027)
Extraversion	0.085 (0.090)	0.061** (0.019)	0.043** (0.016)	-0.031 (0.029)	-0.001 (0.026)	0.019 (0.030)	0.047 (0.030)
Agreeableness	-0.117 (0.098)	-0.020 (0.014)	0.001 (0.011)	-0.006 (0.030)	0.006 (0.023)	-0.050+ (0.029)	-0.007 (0.026)
Neuroticism	0.053 (0.092)	-0.022 (0.021)	0.003 (0.011)	0.018 (0.031)	0.024 (0.028)	0.007 (0.030)	-0.017 (0.030)
Self-esteem	0.132 (0.111)	0.011 (0.015)	0.010 (0.016)	0.004 (0.037)	0.028 (0.027)	0.029 (0.039)	0.021 (0.028)
Business/economics major	-0.014 (0.188)	-0.051+ (0.027)	0.006 (0.026)	-0.002 (0.053)	-0.046 (0.044)	-0.073 (0.054)	-0.033 (0.053)
Female	-0.202 (0.206)	-0.061* (0.027)	-0.031 (0.022)	-0.057 (0.069)	-0.044 (0.067)	0.099 (0.076)	-0.028 (0.060)
Age	0.053 (0.050)	0.012* (0.005)	0.010** (0.004)	-0.002 (0.013)	-0.009 (0.010)	0.010 (0.011)	0.011 (0.011)
Constant	-4.532+ (2.409)						
Observations	189	189	189	189	189	189	189
(Pseudo) R-squared	0.589	0.613	0.509	0.424	0.458	0.372	0.260

Notes: Model (1): OLS regression. Models (2)–(7): probit models, average marginal effects. The variable “Expected positional choices (sum score)” denotes the aggregate number of expected positional choices over the six games (sum of the following six variables, scale from 0 to 6), and the variables “Expected positional choices in game [x]” denote the expected share of positional choices made in game [x]. All personality variables are z-standardized. Robust standard errors in parentheses. \*\* $p < .01$ . \* $p < .05$ . + $p < .10$ .

## **Appendix B) Experimental instructions**

Note: The original instructions are in German and are available upon request.

### **– Sheet 1: participant information –**

Dear students attending the lecture “Labor, human resource management, organization” (*Arbeit, Personal, Organisation*),

#### **Welcome to our experiment!**

We are glad if you take part in our experiment. The aim of the experiment is to better understand preferences.

The data from the experiment are completely kept in confidence and are analyzed only in anonymized form. For this reason, please write neither your name nor your matriculation number on the forms.

The participation in the experiment is voluntary. You can break up your participation at any time without explanation, and this will not result in any disadvantages for you. You can later at any time request the deletion of your data. To this aim, refer to the address on the back of this sheet and give your individual code word, which you determine on the next sheet.

Within the experiment you make six decisions, make a couple of assessments, and answer questions regarding yourself.

#### Decisions:

In each of the six decisions, you decide between two payoff structures. A payoff structure determines how much money should be paid out to you and how much the other player, who is randomly assigned to you, receives.

Example:

Decision: Choose the payoff structure that you prefer:

☐ You receive €2, the other player receives €0. Or:

☐ You receive €1, the other player receives €1.

This means: With your decision between the two payoff structures you determine whether you should get €2 and the player that is assigned to you €0 (first option) or whether each of you should get €1 (second option).

In total, each participant makes six decisions between two payoff structures. After the collection of all sheets, each participant of the experiment is randomly assigned to another participant. For each pair of players, one of the twelve decisions made by these two players in total is randomly selected, and on this basis the payoffs are conducted.

This means, if you had chosen the first payoff structure in the example above and if this decision would have been randomly selected later on, then you would receive €2 and the player that is assigned to you 0€.

The money is paid out on May 8, 2017, after the lecture in front of the lecture hall. For this purpose, please keep the sheet on which you determine your code word (next sheet). After providing the code word you receive the payoff. The payoffs are conducted privately, that is, in concealed envelopes. Additionally, no participant will be informed to which other participant he was assigned. **Note that only those participants who have made all six decisions can participate in the pay-out.**

**Please fill out all sheets independently of the other participants and do not communicate with others.**

**We thank you cordially!**



**– Back of sheet 1 –**

Project leaders:

[Name and affiliation of project leader 1]

[Name and affiliation of project leader 2]

Contact person for possible questions:

[Name of project leader 1]

[Address of project leader 1]

[Telephone number of project leader 1]

[Email address of project leader 1]

**– Sheet 2: code word –****How do you create your personal code word?**

To assign your data correctly without violating the secrecy, we need a password or code word. The code word is constructed such that nobody can draw a conclusion from your code word to your person, we neither. But you can at any time reconstruct your code word if you are asked for it and should have forgotten it. We only have to reveal the rule to you according to which you have to build it.

**These are the components of your code word:**

1. The last two letters of your mother's birth name
2. The number of letters of your mother's first name
3. The last two letters of your father's first name
4. Your own day of birth (only the day, without month and/or year).

\* Please write all numbers with two digits, that is, with leading zero if necessary.

\* In case of several or combined first names, please only consider the first.

\* If you do not know the respective name, please write XX instead of the letters respectively  
00 for the number.

**Example (fictitious)**

Name of the mother: **Elke**-Hannelore Müller, née Mayerhofer

Name of the father: **Wolf**-Rüdiger Müller

Your birthday: November **09**, 1987

This results in the code word: **ER04LF09**

**Please enter your code word now into the boxes:**

The last two letters of your mother's birth name:

The number of letters of your mother's first name:

The last two letters of your father's first name:

Your own day of birth (only the *day*):

**Important:** This list remains with you. Keep it safe! You should not show it to anybody!

– **Sheet 3: declaration of consent** –

**Declaration of consent**

**Hint: This declaration of consent is collected separately from the other sheets. As your name is only written on this declaration and not on the other forms, the anonymity of the experiment remains ensured.**

I (name of the participant in block capitals)

---

have been informed about the study and the experimental procedure in written form. I agree to participate in the experiment and that my data are used in anonymized form. In case I had

questions regarding the study, they were answered completely and to my satisfaction by the experimenters.

I agree with the described collection and processing of the data (game decisions, assessments, and personal information). The recording and analysis of the data is conducted in anonymized form at the LEAD Graduate School & Research Network, that is, by using a personal code word that I have generated and that is only known by myself. This means, it is not possible for anybody to connect the data with my name. The sheet on which I generated this code word is in my possession. I know that I can cancel my consent regarding the storage of my data without disadvantages for me. I have been informed that I can at any time request a deletion of all my data. I agree that my anonymized data can further be used for research purposes and are saved for at least 10 years.

I am informed that my name is only written on this declaration of consent.

I had enough time for a decision and am ready to participate in the above-mentioned study. I know that the participation in the study is voluntary and that I can end the participation at any time without giving reasons and without disadvantages for me.

I have received a copy of the participant information and a copy of the declaration of consent. The participant information is part of this declaration of consent.

Place, date, & signature of the participant:

---

Name of the participant in block capitals:

---

Place, date, & signature of the experimenter:

Tübingen, April 12, 2017 \_\_\_\_\_

Name of the experimenter in block capitals:

[Name of project leader 1]

– **Sheet 4: choices (the order of the six decisions and the order of the two options at each decision are randomized across participants) –**

Please state your **code word** first, which you have determined on the second to last page.

**Attention: Do not leave this field blank**, otherwise we cannot pay out money to you.

Your code word (eight characters, written in one line): \_ \_ \_ \_ \_ \_ \_ \_

Please make the following decisions now. **Be careful to choose exactly one option at each decision (no double choices).**

**Please do not skip any decision.** Otherwise your participation in the pay-out is unfortunately not possible.

1st decision: Choose the payoff structure that you prefer:

☐ You receive €10, the other player receives €10. Or:

☐ You receive €10, the other player receives €5.

2nd decision: Choose the payoff structure that you prefer:

☐ You receive €10, the other player receives €10. Or:

☐ You receive €9, the other player receives €5.

3rd decision: Choose the payoff structure that you prefer:

☐ You receive €5, the other player receives €10. Or:

☐ You receive €5, the other player receives €5.

4th decision: Choose the payoff structure that you prefer:

☐ You receive €5, the other player receives €10. Or:

☐ You receive €4, the other player receives €4.

5th decision: Choose the payoff structure that you prefer:

☐ You receive €8, the other player receives €10. Or:

☐ You receive €8, the other player receives €6.

6th decision: Choose the payoff structure that you prefer:

☐ You receive €8, the other player receives €10. Or:

☐ You receive €7, the other player receives €5.

Thank you very much. We have a couple of further questions for you.

Next sheet →

– **Sheet 5: expectations (the random order of the six decisions and the random order of the two options at each decision are the same as on sheet 4) –**

Now please assess how the other participants have decided. It is not only about the player that is assigned to you but about all participants in the lecture hall who have made all six decisions.

Of the six assessments that you make on this sheet, one is randomly selected. If your guess regarding the option that is chosen more often is correct, you receive a bonus of €1. If your additional guess regarding the percentage is at most 10 percentage points away from the actual percentage, you receive an additional bonus of €1. Thus, you can get up to €2 as a bonus.

1st assessment: The **majority** of the participants chooses:

☐ You receive €10, the other player receives €10. Or:

☐ You receive €10, the other player receives €5.

The **share** of the participants who choose this option (the option that is chosen more often according to your assessment) amounts to: \_\_\_\_\_%

2nd decision: The **majority** of the participants chooses:

☐ You receive €10, the other player receives €10. Or:

☐ You receive €9, the other player receives €5.

The **share** of the participants who choose this option (the option that is chosen more often according to your assessment) amounts to: \_\_\_\_\_%

3rd decision: The **majority** of the participants chooses:

☐ You receive €5, the other player receives €10. Or:

☐ You receive €5, the other player receives €5.

The **share** of the participants who choose this option (the option that is chosen more often according to your assessment) amounts to: \_\_\_\_\_%

4th decision: The **majority** of the participants chooses:

☐ You receive €5, the other player receives €10. Or:

☐ You receive €4, the other player receives €4.

The **share** of the participants who choose this option (the option that is chosen more often according to your assessment) amounts to: \_\_\_\_\_%

5th decision: The **majority** of the participants chooses:

☐ You receive €8, the other player receives €10. Or:

☐ You receive €8, the other player receives €6.

The **share** of the participants who choose this option (the option that is chosen more often according to your assessment) amounts to: \_\_\_\_\_%

6th decision: The **majority** of the participants chooses:

☐ You receive €8, the other player receives €10. Or:

☐ You receive €7, the other player receives €5.

The **share** of the participants who choose this option (the option that is chosen more often according to your assessment) amounts to: \_\_\_\_\_%

Thank you very much. Finally, please answer the questions regarding yourself.

Next sheet →

## – Sheet 6: questionnaire, page 1 –

Please answer the following questions **honestly**. For each question, please encircle one number.

If you have difficulties making a decision, please choose the option that fits best.

**Do not make double choices per question and do not mark spaces between options.**

Please answer **all** questions.

Please indicate how much the following statements apply to you.

	not agree at all ↓			agree completely ↓		
1. I am great.	1	2	3	4	5	6
2. I will someday be famous.	1	2	3	4	5	6
3. I show others how special I am.	1	2	3	4	5	6
4. I react annoyed if another person steals the show from me.	1	2	3	4	5	6
5. I enjoy my successes very much.	1	2	3	4	5	6
6. I secretly take pleasure in the failure of my rivals.	1	2	3	4	5	6
7. Most of the time I am able to draw people's attention to myself in conversations.	1	2	3	4	5	6
8. I deserve to be seen as a great personality.	1	2	3	4	5	6
9. I want my rivals to fail.	1	2	3	4	5	6
10. I enjoy it when another person is inferior to me.	1	2	3	4	5	6
11. I often get annoyed when I am criticized.	1	2	3	4	5	6
12. I can barely stand it if another person is at the center of events.	1	2	3	4	5	6
13. Most people won't achieve anything.	1	2	3	4	5	6
14. Other people are worth nothing.	1	2	3	4	5	6
15. Being a very special person gives me a lot of strength.	1	2	3	4	5	6
16. I manage to be the center of attention with my outstanding contributions.	1	2	3	4	5	6
17. Most people are somehow losers.	1	2	3	4	5	6
18. Mostly, I am very adept at dealing with other people.	1	2	3	4	5	6

Next sheet →

## – Sheet 6: questionnaire, page 2 –

Please indicate how much the following statements apply to you.

I see myself as someone who ...

	does not apply to me at all ↓				applies to me perfectly ↓			
does a thorough job	1	2	3	4	5	6	7	
is communicative, talkative	1	2	3	4	5	6	7	
is sometimes somewhat rude to others	1	2	3	4	5	6	7	
is original, comes up with new ideas	1	2	3	4	5	6	7	
worries a lot	1	2	3	4	5	6	7	
has a forgiving nature	1	2	3	4	5	6	7	
tends to be lazy	1	2	3	4	5	6	7	
is outgoing, sociable	1	2	3	4	5	6	7	
values artistic experiences	1	2	3	4	5	6	7	
gets nervous easily	1	2	3	4	5	6	7	
does things effectively and efficiently	1	2	3	4	5	6	7	
is reserved	1	2	3	4	5	6	7	
is considerate and kind to others	1	2	3	4	5	6	7	
has an active imagination	1	2	3	4	5	6	7	
is relaxed, handles stress well	1	2	3	4	5	6	7	

Please indicate how much the following statements apply to you.

	strongly disagree ↓		strongly agree ↓	
1. On the whole, I am satisfied with myself.	0	1	2	3
2. At times I think I am no good at all.	0	1	2	3
3. I feel that I have a number of good qualities.	0	1	2	3
4. I am able to do things as well as most other people.	0	1	2	3
5. I feel I do not have much to be proud of.	0	1	2	3
6. I certainly feel useless at times.	0	1	2	3
7. I feel that I am a person of worth, at least on an equal plane with others.	0	1	2	3
8. I wish I could have more respect for myself.	0	1	2	3
9. All in all, I am inclined to feel that I am a failure.	0	1	2	3
10. I take a positive attitude toward myself.	0	1	2	3

Please provide the following last information:

Major subject in your studies (exact subject name):

\_\_\_\_\_

Semester in this subject: \_\_\_\_\_



Age in years: \_\_\_\_

Sex: ☐ female ☐ male

**Many thanks!**