

Supplements to
Testing the Relationships Between Narcissism, Risk Attitude, and Income With Data From
a German Representative Population Sample

Table of Contents

Supplement A – Preregistration	2
Supplement B – Measures.....	10
Supplement C – Regression equations.....	11
Supplement D – Cut-off points probit regression.....	13
Supplement E – Regression results comparing data with and without outlier treatment....	14
Supplement F – Scatterplot admiration - rivalry	20
Supplement G – Exploratory analyses: Commonality analysis	21
Supplement H – Exploratory analyses: Predicting income 2019	24
Supplement I – Exploratory analyses: Response surface analysis.....	26
Supplement J – Exploratory analyses: Level-and-difference approach.....	30

Last edited: 24.09.2021

Supplement A – Preregistration

Preregistration documentation (approved by the Editor. The original preregistration is time stamped on OSF but due to a mistake of the authors could not anonymized. For this reason, we attached an anonymized version here in the supplementary materials).

Study Information

1. Title

Testing the relationship between Income, Risk-taking and Narcissism with data from the Socio-Economic Panel

2. Authorship

Anonymous.

3. Research Questions

Risk-taking and narcissism both are positively related to indicators of career success such as income (Paleczek, Bergner, & Rybnicek, 2018; Pfeifer, 2008; Spurk, Keller, & Hirschi, 2016). Past research has investigated the effect of narcissism on income and risk-taking on income independently, we propose to look at both predictors jointly to determine their respective predictive value for income, whilst controlling for age, gender, and employment status (Judge, Higgins, Thoresen, & Barrick, 1999; Judge, Livingston, & Hurst, 2012; Ng, Eby, Sorensen, & Feldman, 2005).

The present study will address three points.

(1) We argue that narcissism is particularly relevant in the context of career success as narcissists have a strong motivation to get ahead (Spain, Harms, & LeBreton, 2014; Spurk et al., 2016). For instance, narcissists strive for fame and power (Raskin & Novacek, 1991) and constantly seek admiration (Morf & Rhodewalt, 2001). Narcissists also pursue situations that are in some way competitive and allow to show superiority and gain status (Morf, Weir, & Davidov, 2000). Back et al. (2013) propose that narcissism has two facets: admiration and rivalry. Each facet is associated with distinct motivational dynamics. Whereas rivalry is based on antagonistic self-defense, which typically results in social conflict, admiration is based on assertive self-enhancement and results in social potency. Due to the different motivational dynamics and the related social consequences we assume that narcissistic admiration has a stronger positive effect on income than narcissistic rivalry.

(2) Past research shows narcissism is associated with more risk-taking (Buelow & Brunell, 2014; Campbell, Goodie, & Foster, 2004; Crysel, Crosier, & Webster, 2013; Foster, Shenese, & Goff, 2009; Meisel, Ning, Campbell, & Goodie, 2016). The measurement of narcissism in these studies was based on the overall score in the NPI (Raskin & Hall, 1979), which reflects grandiose narcissism. As Back et al. (2013) point out grandiose narcissism has two facets admiration and rivalry and each is associated with different motivational dynamics (self-enhancement vs. self-defense). We hypothesize that these two motivations of narcissistic individuals, self-enhancement (admiration), and self-defense (rivalry), will have differential effects on

risk-taking attitudes, whilst controlling for age, gender and income - a difference past research has not addressed.

(3) Furthermore, several aspects of narcissism (i.e. striving for supremacy versus striving for uniqueness) are linked to striving for achievement (e.g. Elliot & Thrash, 2001) and the desire to “get ahead” (e.g. Spain et al., 2014) which is why we furthermore want to investigate the relationship between narcissism (“getting ahead”), the willingness to take risks and actual success in getting ahead (Zou, Scholer, & Higgins, 2020; 2014), which is why we furthermore hypothesize a mediating effect (Preacher, Rucker, & Hayes, 2007) of risk-taking on the positive relationship between narcissism and gross income, whilst controlling for age, gender and employment status.

4. Hypotheses

Based on the considerations above, we present the following hypotheses:

(1) Narcissistic admiration (H1a), narcissistic rivalry (H1b) and risk-taking (H1c) positively predict income. However, we expect the effect of narcissistic rivalry on income to be less positive than the effect of narcissistic admiration.

(2) Narcissistic admiration (H2a) and narcissistic rivalry (H2b) positively predict risk-taking. Further, we expect the effect of narcissistic rivalry on risk-taking to be less positive than the effect of narcissistic admiration.

(3) Risk-taking mediates the relationship between narcissistic admiration and income (H3a) and the relationship between narcissistic rivalry and income (H3b).

Sampling Plan and Measures

The study is an observational study using secondary data.

We will use data from the German Socio-Economic Panel (SOEP) study. The Socio-Economic Panel is a long-running household panel study that provides a representative view of the structure and traits of the entire population living in Germany (Wagner, Frick, & Schupp, 2007). Data from households and individuals have been collected annually since 1984 (Goebel et al., 2008). We will use data from the individual questionnaires that are completed by all adults from age 17 on living in these households. We will work with the recent release of SOEP-Core data at the time of preregistration that is v35 in 2018 (DOI: 10.5684/soep-core.v35).

The SOEP report of survey methodology and fieldwork provides detailed information on the subsamples of the SOEP-Core that had been interviewed in 2018, including the number of households, response rates and the fieldwork procedure (Bohlender, Rathje, Glemser, Rathje, & Glemser, 2020). Table 1 provides information about the variables that we will use in our

analyses. It includes the item wording and the response format. Risk-taking is measured based on self-reported risk-taking propensity. Information about the scale references for risk-taking is provided in the SOEP Scales manual (there the construct is termed "risk aversion", e.g.; Richter et al., 2017). Narcissism was measured with the Narcissistic Admiration and Rivalry Questionnaire short scale (NARQ-S) which contains six items, where three are used to measure admiration and three items measure rivalry (Leckelt et al., 2018). We will use the aggregated mean of each scale for the hypothesis on risk-taking and the aggregated mean of all six items for the hypothesis on income. Furthermore, for the hypothesis on risk-taking we will control for age, gender, and gross income. For the hypotheses on income we will control for gender, age and employment status.

In the analyses, we will recode the Date of Birth into a continuous variable describing age. We use the year and month of birth and subtract it from the mean of the fieldwork period, which was from February until August 2018 (Bohlender et al., 2020). We will recode the variable describing employment status into a dichotomous variable indicating full- or part-time employment. For gross income, we will use the log-transformed values of the imputed gross income variable provided by the SOEP to account for the right-skewness of the distribution of gross income. The imputation process for income in the SOEP-Core datasets is described by Frick and Grabka (2014). Furthermore, we will use survey weights provided by the SOEP, to guarantee representativeness of the sample for the population living in Germany (e.g.; Goebel et al., 2008; Pischner, 2007).

Table 2

Overview of Variables, Item wording and Response format in the SOEP-Core dataset 2018

Construct / Variable	Item wording	Response format
General risk aversion	Are you generally a person who is willing to take risks or do you try to avoid taking risks? Please tick a box on the scale, the value 0 means not at all willing to take risks and the value 10 means very willing to take risks.	11-point Likert scale
Narcissism	To what degree do the following statements apply to you personally? Please answer according to the following scale. 1 means: does not apply to me at all, 6 means: applies to me perfectly. a) Being a very special person gives me a lot of strength. (admiration) b) I manage to be the center of attention with my outstanding contributions. (admiration) c) I react with annoyance if another person steals the show from me. (rivalry) d) I deserve to be seen as a great personality. (admiration) e) I want my rivals to fail. (rivalry) f) Most people are basically losers. (rivalry)	6-point Likert scale
Age	Date of birth of respondent	-
Gender	Sex of respondent	Male (0), Female (1)
Employment status	Are you currently employed? Which one of the following applies best to your status? a) Employed full-time b) Employed part-time c) Completing in-service training / apprenticeship / in-service retraining d) In marginal or irregular employment e) In partial retirement, phase with zero working hours f) Voluntary social / ecological year, federal volunteer service g) Not employed	7 categories
Imputed gross income	What did you earn from your work last month? If you received extra income such as vacation pay or back pay, please do not include this. Please do include overtime pay. If you are self-employed: Please estimate your monthly income before and after taxes. Please state (...) gross income, which means income before deduction of taxes and social security.	Measured in Euro

Analysis Plan

We will test the effects of narcissistic admiration and rivalry and risk-taking on log-gross-income using a multiple regression model.

The regression equation is defined as follows:

i = respondent 1,...,n

y_i = respondent i 's value of monthly log-gross-income

x_i = vector of characteristics explaining log-gross-income

$$y_i = x'_{i1}\beta_1 + x'_{i2}\beta_2 + x'_{i3}\beta_3 + x'_{i4}\beta_4 + x'_{i5}\beta_5 + x'_{i6}\beta_6 + \varepsilon_i$$

where $x'_{i1}\beta_1$ is the variable rivalry and it's regression coefficient, $x'_{i2}\beta_2$ is the variable admiration and it's regression coefficient, $x'_{i3}\beta_3$ is the variable age and it's regression coefficient, $x'_{i4}\beta_4$ is the variable gender and it's regression coefficient, and $x'_{i5}\beta_5$ is the variable employment status and it's regression coefficient, and $x'_{i6}\beta_6$ is the variable risk-taking and its regression coefficient, and ε_i is the error term.

We will test the effects of narcissistic admiration and rivalry on risk-taking using an ordered – probit regression model.

The regression equation is defined as follows:

i = respondent 1,...,n

y_i = respondent i 's response to risk-taking with the assumption that this can take the integer values 1,2,3,...11.

$y_i^*(-\infty < y_i^* < +\infty)$ = latent variable representing respondent's i 's propensity to risk-taking

x_i = vector of characteristics explaining risk-taking

$$y_i^* = x'_{i1}\beta_1 + x'_{i2}\beta_2 + x'_{i3}\beta_3 + x'_{i4}\beta_4 + x'_{i5}\beta_5 + \varepsilon_i$$

where $x'_{i1}\beta_1$ is the variable rivalry and it's regression coefficient, $x'_{i2}\beta_2$ is the variable admiration and it's regression coefficient, $x'_{i3}\beta_3$ is the variable age and it's regression coefficient, $x'_{i4}\beta_4$ is the variable gender and it's regression coefficient, and $x'_{i5}\beta_5$ is the variable log-gross-income and it's regression coefficient, and ε_i is the error term.

For testing the mediation of risk-taking on the relationship of narcissistic admiration and logarithmic gross income, we will use mediated regression analysis. The regression equation is defined as follows:

i = respondent 1,...,n

y_i = respondent i 's response to gross income (log transformed)

x_i = vector of characteristics explaining gross income

Me = mediator variable risk-taking

$$Me = x'_{i1}\beta_1 + x'_{i2}\beta_2 + x'_{i3}\beta_3 + x'_{i4}\beta_4 + x'_{i5}\beta_5$$

$$y_i = x'_{i1}\beta_1 + x'_{i2}\beta_2 + x'_{i3}\beta_3 + x'_{i4}\beta_4 + x'_{i5}\beta_5 + Me + \varepsilon_i$$

where $x'_{i1}\beta_1$ is the variable rivalry and its regression coefficient, $x'_{i2}\beta_2$ is the variable admiration and its regression coefficient, $x'_{i3}\beta_3$ is the variable age and its regression coefficient, $x'_{i4}\beta_4$ is the variable gender and its regression coefficient, and $x'_{i5}\beta_5$ is the variable employment status and its regression coefficient and ε_1 is the error term.

For the analyses of all statistical models, we will use R (R Development Core Team, 2020).

References

- Back, M. D., Küfner, A. C. P., Dufner, M., Gerlach, T. M., Rauthmann, J. F., & Denissen, J. J. A. (2013). Narcissistic admiration and rivalry: Disentangling the bright and dark sides of narcissism. *Journal of Personality and Social Psychology*, 105(6), 1013–1037.
- Bohlender, A., Rathje, M., Glemser, A., Rathje, M., & Glemser, A. (2020). SOEP-Core – 2018: Report of Survey Methodology and Fieldwork.
- Buelow, M. T., & Brunell, A. B. (2014). Facets of grandiose narcissism predict involvement in health-risk behaviors. *Personality and Individual Differences*, 69, 193–198.
- Campbell, W. K., Goodie, A. S., & Foster, J. D. (2004). Narcissism, confidence, and risk attitude. *Journal of Behavioral Decision Making*, 17(4), 297–311.
- Crysel, L. C., Crosier, B. S., & Webster, G. D. (2013). The Dark Triad and risk behavior. *Personality and Individual Differences*, 54(1), 35–40.
- Foster, J. D., Shenese, J. W., & Goff, J. S. (2009). Why do narcissists take more risks? Testing the roles of perceived risks and benefits of risky behaviors. *Personality and Individual Differences*, 47(8), 885–889.
- Frick, J. R., & Grapka, M. M. (2014). Missing Income Data in the German SOEP : Incidence, Imputation and its Impact on the Income distribution. SOEP Survey Papers.
- Goebel, J., Grabka, M. M., Krause, P., Kroh, M., Pischner, R., Sieber, I., & Spieß, M. (2008). Mikrodaten, Gewichtung und Datenstruktur der Längsschnittstudie Sozio-oekonomisches Panel (SOEP). *Vierteljahrshefte Zur Wirtschaftsforschung*, 77(3), 77–109.

- Judge, T. A., Higgins, C. A., Thoresen, C. J., & Barrick, M. R. (1999). The big five personality traits, general mental ability, and career success across the life span. *Personnel Psychology*, 52(3), 621–652.
- Judge, T. A., Livingston, B. A., & Hurst, C. (2012). Do nice guys-and gals-really finish last? The joint effects of sex and agreeableness on income. *Journal of Personality and Social Psychology*, 102(2), 390–407.
- Leckelt, M., Wetzel, E., Gerlach, T. M., Ackerman, R. A., Miller, J. D., Chopik, W. J., ... Back, M. D. (2018). Validation of the narcissistic admiration and rivalry questionnaire short scale (NARQ-S) in convenience and representative samples. *Psychological Assessment*, 30(1), 86–96.
- Meisel, M. K., Ning, H., Campbell, W. K., & Goodie, A. S. (2016). Narcissism, overconfidence, and risk taking in U.S. and chinese student samples. *Journal of Cross-Cultural Psychology*, 47(3), 385–400.
- Ng, T. W. H., Eby, L. T., Sorensen, K. L., & Feldman, D. C. (2005). Predictors of objective and subjective career success: A meta-analysis. *Personnel Psychology*, 58(2), 367–408.
- Pischner, R. (2007). Rainer Pischner Die Querschnittsgewichtung und die Hochrechnungsfaktoren des Sozio-oekonomischen Panels (SOEP) ab Release 2007 (Welle W) (Vol. 2007). Berlin.
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research*, 42(1), 185–227.
- R Development Core Team. (2020). R: A language and environment for statistical computing. R Foundation for Statistical Computing. Vienna, Austria: R Foundation for Statistical Computing.

- Raskin, R. N., & Hall, C. S. (1979). A narcissistic personality inventory. *Psychological Reports*, 45(2), 590–590.
- Richter, D., Rohrer, J., Metzing, M., Nestler, W., Weinhardt, M., & Schupp, J. (2017). SOEP Scales Manual (updated for SOEP-Core v32.1). SOEP Survey Papers.
- Wagner, G. G., Frick, J. R., & Schupp, J. (2007). The German Socio-Economic Panel Study (SOEP) – Scope, evolution and enhancements. SOEPpapers on Multidisciplinary Panel Data Research at DIW Berlin This, (July).
- Wagner, G. G., Frick, J. R., & Schupp, J. (2007). The German Socio-Economic Panel Study (SOEP) – Scope, Evolution and Enhancements. SOEPpapers on Multidisciplinary Panel Data Research.

Supplement B – Measures*Overview of Variables, Item wording and Response format in the SOEP-Core dataset 2018*

Construct / Variable	Item wording	Response format
General risk aversion	Are you generally a person who is willing to take risks or do you try to avoid taking risks? Please tick a box on the scale, the value 0 means not at all willing to take risks and the value 10 means very willing to take risks.	11-point Likert scale
Narcissism	To what degree do the following statements apply to you personally? Please answer according to the following scale. 1 means: does not apply to me at all, 6 means: applies to me perfectly. a) Being a very special person gives me a lot of strength. (admiration) b) I manage to be the center of attention with my outstanding contributions. (admiration) c) I react with annoyance if another person steals the show from me. (rivalry) d) I deserve to be seen as a great personality. (admiration) e) I want my rivals to fail. (rivalry) f) Most people are basically losers. (rivalry)	6-point Likert scale
Age	Date of birth of respondent	-
Gender	Sex of respondent	Male (0), Female (1)
Employment status	Are you currently employed? Which one of the following applies best to your status? a) Employed full-time b) Employed part-time c) Completing in-service training / apprenticeship / in-service retraining d) In marginal or irregular employment e) In partial retirement, phase with zero working hours f) Voluntary social / ecological year, federal volunteer service g) Not employed	7 categories
Imputed gross income	What did you earn from your work last month? If you received extra income such as vacation pay or back pay, please do not include this. Please do include overtime pay. If you are self-employed: Please estimate your monthly income before and after taxes. Please state (...) gross income, which means income before deduction of taxes and social security.	Measured in Euro

Supplement C – Regression equations*Regression equations*

To test the effects of narcissistic admiration and rivalry and risk attitude on log-gross-income, we used a multiple regression model. The regression equation is defined as follows:

i = respondent 1,...,n

y_i = respondent i 's value of monthly log-gross-income

x_i = vector of characteristics explaining log-gross-income

$$y_i = x'_{i1}\beta_1 + x'_{i2}\beta_2 + x'_{i3}\beta_3 + x'_{i4}\beta_4 + x'_{i5}\beta_5 + x'_{i6}\beta_6 + \varepsilon_i$$

where $x'_{i1}\beta_1$ is the variable rivalry and its regression coefficient, $x'_{i2}\beta_2$ is the variable admiration and its regression coefficient, $x'_{i3}\beta_3$ is the variable risk attitude and its regression coefficient, $x'_{i4}\beta_4$ is the variable age and its regression coefficient, and $x'_{i5}\beta_5$ is the variable gender and its regression coefficient, and $x'_{i6}\beta_6$ is the variable employment status and its regression coefficient and ε_i is the error term.

To test the effects of narcissistic admiration and rivalry on risk attitude, we used an ordered – probit regression model. The regression equation is defined as follows:

i = respondent 1,...,n

y_i = respondent i 's response to risk attitude with the assumption that this can take the integer values 1,2,3,...11.

$y_i^*(-\infty < y_i^* < +\infty)$ = latent variable representing respondent's i 's propensity to risk attitude

x_i = vector of characteristics explaining risk attitude

$$y_i^* = x'_{i1}\beta_1 + x'_{i2}\beta_2 + x'_{i3}\beta_3 + x'_{i4}\beta_4 + x'_{i5}\beta_5 + \varepsilon_i$$

where $x'_{i1}\beta_1$ is the variable rivalry and its regression coefficient, $x'_{i2}\beta_2$ is the variable admiration and its regression coefficient, $x'_{i3}\beta_3$ is the variable age and its regression coefficient, $x'_{i4}\beta_4$ is the variable gender and its regression coefficient, and $x'_{i5}\beta_5$ is the variable log-gross-income and its regression coefficient, and ε_i is the error term.

To test the mediation of risk attitude on the relationship of narcissistic admiration and logarithmic gross income, we used mediated regression analysis. The regression equation is defined as follows:

i = respondent 1,...,n

y_i = respondent i 's response to gross income (log transformed)

x_i = vector of characteristics explaining gross income

Me = mediator variable risk attitude

$$Me = x'_{i1}\beta_1 + x'_{i2}\beta_2 + x'_{i3}\beta_3 + x'_{i4}\beta_4 + x'_{i5}\beta_5$$

$$y_i = x'_{i1}\beta_1 + x'_{i2}\beta_2 + x'_{i3}\beta_3 + x'_{i4}\beta_4 + x'_{i5}\beta_5 + Me + \varepsilon_i$$

where $x'_{i1}\beta_1$ is the variable rivalry and its regression coefficient, $x'_{i2}\beta_2$ is the variable admiration and its regression coefficient, $x'_{i3}\beta_3$ is the variable age and its regression coefficient, $x'_{i4}\beta_4$ is the variable gender and its regression coefficient, and $x'_{i5}\beta_5$ is the variable employment status and its regression coefficient and ε_i is the error term.

We describe an equal mediation model for the mediation of rivalry with $x'_{i2}\beta_2$ being the variable rivalry and its regression coefficient.

Supplement D – Cut-off points probit regression**Table S1***Cut-off Points for the Risk Attitude from the Weighted Probit-regression Analysis*

Intercepts	Value	Standard Error	t-value
0 1	-1.7443	0.0006	-2740.8384
1 2	-1.2552	0.0006	-2193.9867
2 3	-0.6888	0.0005	-1269.3607
3 4	-0.2129	0.0005	-398.6960
4 5	0.0520	0.0005	97.6563
5 6	0.5190	0.0005	968.8829
6 7	0.8550	0.0005	1573.4686
7 8	1.2994	0.0006	2307.0810
8 9	1.9752	0.0006	3109.2358
9 10	2.4294	0.0008	3219.9696

Supplement E – Regression results comparing data with and without outliers**Table S2***Standardized Regression Results for Predicting Risk Attitude From Admiration and Rivalry With and Without Covariates, Weights, and Outliers*

Predictor	Without weights				With weights			
	With outliers		Without outliers		With outliers		Without outliers	
	β	β	β	β	β	β	β	β
Admiration	0.17*** (0.15, 0.19)	0.16*** (0.14, 0.18)	0.17*** (0.15, 0.19)	0.16*** (0.14, 0.18)	0.18*** (0.18, 0.18)	0.17*** (0.17, 0.17)	0.18*** (0.18, 0.18)	0.17*** (0.17, 0.17)
Rivalry	0.03*** (0.01, 0.05)	-0.01 (-0.03, 0.01)	0.03*** (0.01, 0.05)	-0.01 (-0.03, 0.01)	0.03*** (0.03, 0.03)	-0.01*** (-0.01, -0.01)	0.03*** (0.03, 0.03)	-0.01*** (-0.01, -0.01)
Age		-0.11*** (-0.13, -0.09)		-0.11*** (-0.13, -0.09)		-0.07*** (-0.07, -0.07)		-0.08*** (-0.08, -0.08)
Female		-0.20*** (-0.22, -0.18)		-0.20*** (-0.21, -0.18)		-0.20*** (-0.20, -0.20)		-0.19*** (-0.19, -0.19)
Observations	14,608	14,608	14,473	14,473	36,633,768	36,633,768	36,312,034	36,312,034

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table S3

Unstandardized Regression Results for Predicting Risk Attitude From Admiration and Rivalry With and Without Covariates, Weights, and Outliers

Predictor	Without weights				With weights			
	With outliers		Without outliers		With outliers		Without outliers	
	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
Admiration	0.15*** (0.13, 0.16)	0.14*** (0.12, 0.16)	0.15*** (0.13, 0.16)	0.14*** (0.12, 0.16)	0.15*** (0.15, 0.15)	0.15*** (0.15, 0.15)	0.16*** (0.15, 0.16)	0.15*** (0.15, 0.15)
Rivalry	0.03*** (0.01, 0.06)	-0.01 (-0.03, 0.01)	0.03*** (0.01, 0.06)	-0.01 (-0.03, 0.01)	0.03*** (0.03, 0.03)	-0.01*** (-0.01, -0.01)	0.03*** (0.03, 0.03)	-0.01*** (-0.01, -0.01)
Age		-0.01*** (-0.01, -0.01)		-0.01*** (-0.01, -0.01)		-0.01*** (-0.01, -0.01)		-0.01*** (-0.01, -0.01)
Female		-0.40*** (-0.43, -0.36)		-0.39*** (-0.43, -0.36)		-0.39*** (-0.39, -0.39)		-0.39*** (-0.39, -0.39)
Observations	14,608	14,608	14,473	14,473	36,633,768	36,633,768	36,312,034	36,312,034

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table S4

Standardized Regression Results for Predicting Income From Risk Attitude, Admiration, and Rivalry Without Weights and With and Without Covariates and Outliers

Predictor	With outliers		Without outliers	
	β	β	β	β
Admiration	0.03*** (0.01, 0.04)	0.03*** (0.02, 0.04)	0.02*** (0.01, 0.04)	0.03*** (0.02, 0.04)
Rivalry	-0.01 (-0.03, 0.01)	-0.04*** (-0.05, -0.03)	-0.01 (-0.02, 0.01)	-0.04*** (-0.05, -0.03)
Age		0.10*** (0.09, 0.12)		0.10*** (0.09, 0.11)
Female		-0.04*** (-0.05, -0.02)		-0.03*** (-0.04, -0.02)
Full-time		0.56*** (0.54, 0.57)		0.55*** (0.54, 0.56)
Risk attitude	0.04*** (0.02, 0.05)	-0.01 (-0.02, 0.005)	0.03*** (0.02, 0.05)	-0.01** (-0.02, -0.001)
Constant	7.63*** (7.61, 7.64)	7.63*** (7.61, 7.64)	7.61*** (7.59, 7.62)	7.61*** (7.60, 7.62)
Observations	14,608	14,608	14,473	14,473
R ²	0.003	0.42	0.002	0.42
Adjusted R ²	0.003	0.42	0.002	0.42
Residual Std. Error	0.90 (df = 14604)	0.68 (df = 14601)	0.88 (df = 14469)	0.67 (df = 14466)
F Statistic	14.04*** (df = 3; 14604)	1,781.21*** (df = 6; 14601)	10.00*** (df = 3; 14469)	1,767.51*** (df = 6; 14466)

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table S5

Standardized Regression Results for Predicting Income From Risk Attitude, Admiration, and Rivalry With Weights and With and Without Covariates and Outliers

Predictor	With outliers		Without outliers	
	β	β	β	β
Admiration	0.01 (-0.01, 0.03)	0.02** (0.003, 0.03)	0.01 (-0.01, 0.03)	0.02** (0.003, 0.03)
Rivalry	-0.01 (-0.03, 0.01)	-0.03*** (-0.04, -0.02)	-0.01 (-0.03, 0.01)	-0.03*** (-0.04, -0.02)
Age		0.07*** (0.06, 0.08)		0.07*** (0.06, 0.08)
Female		-0.02*** (-0.03, -0.01)		-0.02*** (-0.03, -0.01)
Full-time		0.58*** (0.57, 0.60)		0.58*** (0.57, 0.59)
Risk attitude	0.05*** (0.04, 0.07)	0.001 (-0.01, 0.01)	0.04*** (0.03, 0.06)	-0.01 (-0.02, 0.01)
Constant	7.67*** (7.65, 7.68)	7.61*** (7.60, 7.62)	7.65*** (7.63, 7.66)	7.59*** (7.58, 7.60)
Observations	14,608	14,608	14,473	14,473
R ²	0.003	0.43	0.002	0.43
Adjusted R ²	0.003	0.43	0.002	0.43
Residual Std. Error	44.58 (df = 14508)	33.82 (df = 14505)	43.81 (df = 14374)	33.17 (df = 14371)
F Statistic	16.56*** (df = 3; 14508)	1,800.07*** (df = 6; 14505)	11.77*** (df = 3; 14374)	1,795.11*** (df = 6; 14371)

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table S6

Unstandardized Regression Results for Predicting Income From Risk Attitude, Admiration, and Rivalry Without Weights and With and Without Covariates and Outliers

Predictor	With outliers		Without outliers	
	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
Admiration	0.02*** (0.01, 0.04)	0.03*** (0.02, 0.04)	0.02*** (0.01, 0.03)	0.02*** (0.01, 0.04)
Rivalry	-0.01 (-0.03, 0.01)	-0.05*** (-0.07, -0.03)	-0.01 (-0.03, 0.01)	-0.05*** (-0.06, -0.03)
Age		0.01*** (0.01, 0.01)		0.01*** (0.01, 0.01)
Female		-0.07*** (-0.10, -0.05)		-0.06*** (-0.08, -0.03)
Full-time		1.14*** (1.11, 1.16)		1.13*** (1.10, 1.15)
Risk attitude	0.02*** (0.01, 0.02)	-0.003 (-0.01, 0.002)	0.01*** (0.01, 0.02)	-0.01** (-0.01, -0.0003)
Constant	7.52*** (7.47, 7.56)	7.00*** (6.96, 7.04)	7.51*** (7.47, 7.56)	7.00*** (6.95, 7.04)
Observations	14,608	14,608	14,473	14,473
R ²	0.003	0.42	0.002	0.42
Adjusted R ²	0.003	0.42	0.002	0.42
Residual Std. Error	0.90 (df = 14604)	0.68 (df = 14601)	0.88 (df = 14469)	0.67 (df = 14466)
F Statistic	14.04*** (df = 3; 14604)	1,781.21*** (df = 6; 14601)	10.00*** (df = 3; 14469)	1,767.51*** (df = 6; 14466)

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table S7

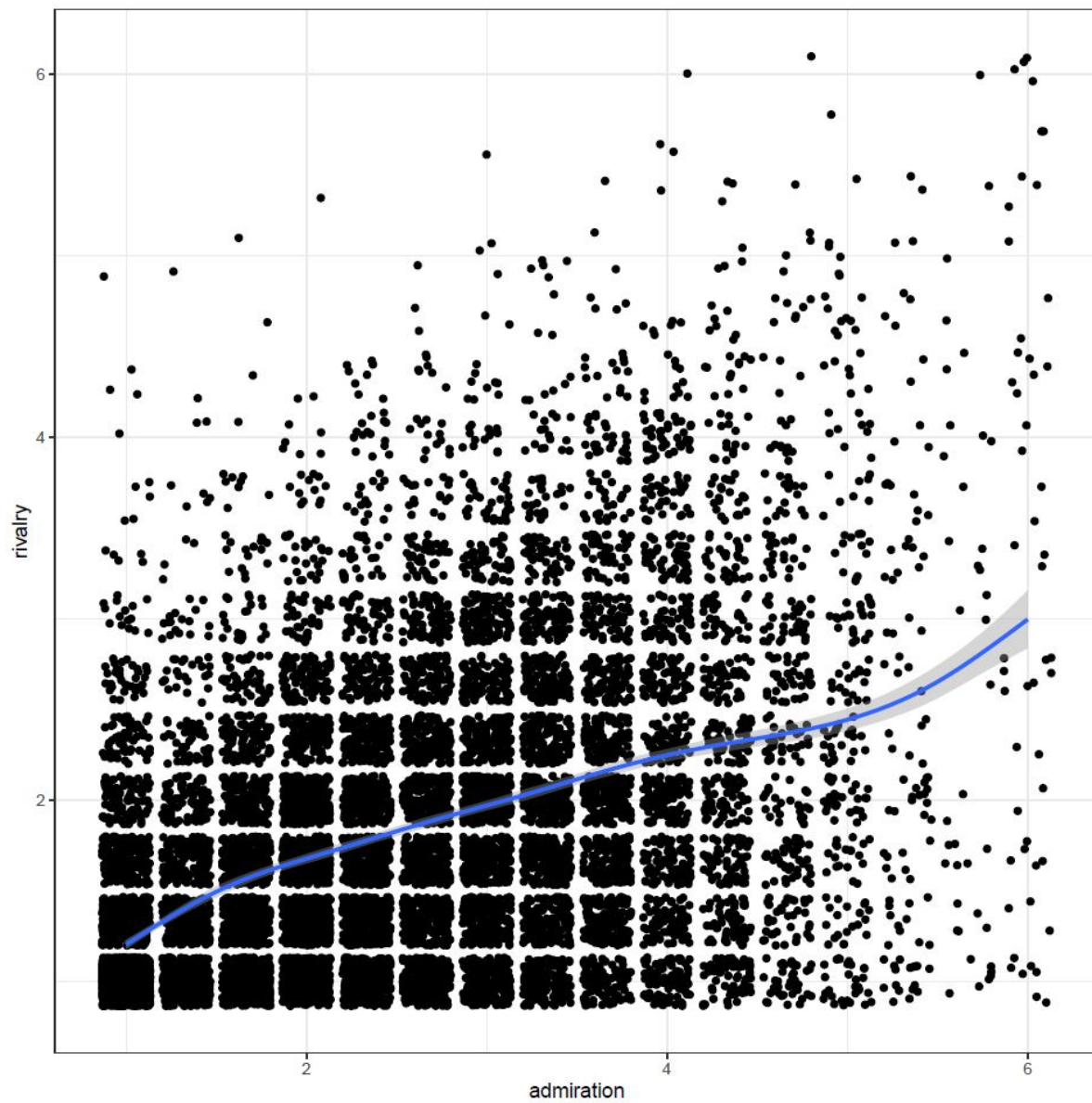
Unstandardized Regression Results for Predicting Income From Risk Attitude, Admiration, and Rivalry With Weights and With and Without Covariates and Outliers

Predictor	With outliers		Without outliers	
	<i>B</i>	<i>B</i>	<i>B</i>	<i>B</i>
Admiration	0.01 (-0.01, 0.02)	0.01** (0.003, 0.03)	0.01 (-0.01, 0.02)	0.01** (0.002, 0.02)
Rivalry	-0.01 (-0.03, 0.01)	-0.04*** (-0.05, -0.02)	-0.01 (-0.03, 0.01)	-0.04*** (-0.05, -0.02)
Age		0.01*** (0.01, 0.01)		0.01*** (0.004, 0.01)
Female		-0.04*** (-0.07, -0.02)		-0.03*** (-0.06, -0.01)
Full-time		1.20*** (1.18, 1.23)		1.19*** (1.16, 1.21)
Risk attitude	0.02*** (0.02, 0.03)	0.0005 (-0.004, 0.01)	0.02*** (0.01, 0.02)	-0.002 (-0.01, 0.003)
Constant	7.57*** (7.52, 7.61)	6.93*** (6.88, 6.97)	7.57*** (7.53, 7.62)	6.93*** (6.89, 6.98)
Observations	14,608	14,608	14,473	14,473
R ²	0.003	0.43	0.002	0.43
Adjusted R ²	0.003	0.43	0.002	0.43
Residual Std. Error	44.58 (df = 14508)	33.82 (df = 14505)	43.81 (df = 14374)	33.17 (df = 14371)
F Statistic	16.56*** (df = 3; 14508)	1,800.07*** (df = 6; 14505)	11.77*** (df = 3; 14374)	1,795.11*** (df = 6; 14371)

* $p < .05$. ** $p < .01$. *** $p < .001$.

Supplement F – Scatterplot admiration - rivalry**Figure S1**

Bivariate Scatterplot for Narcissistic Admiration and Rivalry in the SOEP Sample (N = 14,473)



Supplement G – Exploratory analyses: Commonality analyses**Table S8***Output From the Commonality Analyses for the Model Without Covariates*

	Coefficient	% Total
Unique to admiration	0.0005	26.52
Unique to rivalry	0.0001	3.49
Unique to risk attitude	0.0012	58.2
Common to admiration and risk attitude	0.0003	13.54
Common to admiration, rivalry, and risk attitude	0	2.14
Common to rivalry and risk attitude	0	-0.63
Common to admiration and rivalry	-0.0001	-3.26
Total	0.0021	100

Note. Representing commonality coefficients, both unique and common, along with the % total contribution of each predictor variable or sets of predictor variables to the regression effect. The common coefficients are ordered according to their relative % contribution.

Table S9*Output From the Commonality Analyses for the Model With Covariates*

	Coefficient	% Total
Unique to admiration	0.0008	0.19
Unique to rivalry	0.0016	0.37
Unique to risk attitude	0.0002	0.04
Unique to age	0.0117	2.76
Unique to female	0.0009	0.21
Unique to full-time	0.3188	75.36
Common to female and full-time	0.0818	19.34
Common to age and full-time	0.0049	1.16
Common to age, female, and full-time	0.0027	0.65
Common to risk attitude, female, and full-time	0.0024	0.57
Common to admiration, rivalry, female, and full-time	0.0011	0.25
Common to rivalry and age	0.0007	0.17
Common to admiration and full-time	0.0007	0.17
Common to admiration, risk attitude, female, and full-time	0.0005	0.13
Common to risk attitude and age	0.0004	0.11
Common to admiration, rivalry, and age	0.0002	0.06
Common to admiration, rivalry, risk attitude, female, and full-time	0.0002	0.05
Common to age and female	0.0001	0.03
Common to admiration, rivalry, risk attitude, and age	0.0001	0.03
Common to admiration, rivalry, and risk attitude	0	0.01
Common to admiration, rivalry, and female	0.0001	0.01
Common to admiration, risk attitude, and female	0	0.01
Common to admiration, risk attitude, and full-time	0	0.01
Common to rivalry, age, and full-time	0	0.01
Common to admiration, age, female, and full-time	0	0.01
Common to rivalry and risk attitude	0	0
Common to rivalry, risk attitude, and age	0	0
Common to rivalry, risk attitude, and female	0	0
Common to admiration, age, and female	0	0
Common to rivalry, risk attitude, and full-time	0	0
Common to admiration, risk attitude, age, and female	0	0
Common to rivalry, risk attitude, age, and female	0	0
Common to rivalry, risk attitude, age, and full-time	0	0
Common to rivalry, risk attitude, female, and full-time	0	0
Common to admiration, rivalry, risk attitude, age, and female	0	0
Common to admiration and female	0	-0.01
Common to admiration, risk attitude, and age	0	-0.01
Common to rivalry, age, and female	-0.0001	-0.01
Common to risk attitude, age, and full-time	-0.0001	-0.01
Common to admiration, rivalry, risk attitude, and female	0	-0.01
Common to admiration, rivalry, age, and female	0	-0.01
Common to admiration, rivalry, risk attitude, and full-time	0	-0.01
Common to admiration, rivalry, risk attitude, age, and full-time	0	-0.01

	Coefficient	% Total
Common to rivalry, risk attitude, age, female, and full-time	0	-0.01
Common to admiration and risk attitude	-0.0001	-0.02
Common to admiration, risk attitude, age, and full-time	-0.0001	-0.02
Common to risk attitude and female	-0.0001	-0.03
Common to risk attitude and full-time	-0.0001	-0.03
Common to risk attitude, age, and female	-0.0001	-0.03
Common to admiration, risk attitude, age, female, and full-time	-0.0001	-0.03
Common to admiration, rivalry, and full-time	-0.0002	-0.04
Common to admiration, rivalry, age, and full-time	-0.0002	-0.04
Common to rivalry and female	-0.0002	-0.05
Common to admiration, rivalry, risk attitude, age, female, and full-time	-0.0002	-0.05
Common to admiration, age, and full-time	-0.0003	-0.06
Common to admiration, female, and full-time	-0.0003	-0.08
Common to admiration and age	-0.0004	-0.09
Common to rivalry and full-time	-0.0004	-0.1
Common to admiration, rivalry, age, female, and full-time	-0.0004	-0.1
Common to admiration and rivalry	-0.0007	-0.15
Common to rivalry, age, female, and full-time	-0.0006	-0.15
Common to rivalry, female, and full-time	-0.0009	-0.22
Common to risk attitude, age, female, and full-time	-0.0014	-0.34
Total	0.423	100

Note. Representing commonality coefficients, both unique and common, along with the %

total contribution of each predictor variable or sets of predictor variables to the regression

effect. The common coefficients are ordered according to their relative % contribution.

Supplement H – Exploratory analyses: Predicting income 2019

First, to predict log income in 2019, we fit the same regression models as in the main analyses of the 2018 data with and without controls for a panel consisting of participants with responses in 2018 and 2019 (balanced panel). We included the predictor values for the controls (age, gender, and employment status) in 2019 and the predictor values for admiration, rivalry, and risk attitude in 2018.

Table S10

Fitted Unstandardized Regression Coefficients Predicting Log Income in 2019 With the Balanced Panel

Predictors	Without controls <i>B</i>	With controls <i>B</i>
Int.	7.58 *** [7.53,7.62]	7.15 *** [7.11,7.20]
Admiration in 2018	0.03 *** [0.01,0.04]	0.02 *** [0.01,0.03]
Rivalry in 2018	0.00 [-0.02,0.02]	-0.04 *** [-0.05,-0.02]
Risk attitude in 2018	0.02 *** [0.01,0.03]	-0.00 [-0.01,0.00]
Age in 2019		0.00 *** [0.00,0.01]
Gender in 2019		-0.08 *** [-0.11,-0.05]
Employment status in 2019		1.00 *** [0.98,1.03]
Observations	11215	11215
R ² / R ² adjusted	0.005 / 0.005	0.382 / 0.382

* $p < .05$. ** $p < .01$. *** $p < .001$.

Second, to test whether risk attitude and the dimensions of narcissism (admiration and rivalry) had incremental predictive validity over the controls when predicting income, we

used the model we fit to the 2018 data to predict income in 2019. For this reason, the intercepts and coefficients might differ slightly from the model that was fit to the 2019 data.

We predicted income in 2019 with the balanced panel. We used the regression coefficients that were fit to predictor values in 2018 along with the predictor values in 2019 for the control variables and the predictor values for admiration, rivalry, and risk attitude in 2018.

The model and coefficients for the covariates-only regression were:

$$(1) \log \widehat{income}_{2019,i} = 7.05 + 0.01 * age_{2019,i} - 0.07 * Gender_{2019,i} + 1.05 * employment\ status_{2019,i}$$

The model and coefficients for the model including admiration, rivalry, and risk attitude were:

$$(2) \log \widehat{income}_{2019,i} = 7.07 + 0.02 * admiration_{2018,i} - .04 * rivalry_{2018,i} + 0 * risk\ attitude_{2018,i} + 0.01 * age_{2019,i} - 0.08 * Gender_{2019,i} + 1.05 * employment\ status_{2019,i}$$

As a measure of the model's predictive error, we used the root mean standard error (RMSE).

$$RMSE = \sqrt{\frac{\sum (y - \hat{y})^2}{n}}$$

The resulting RMSE values are presented in Table S11.

Table S11

Resulting RMSE Predicting Log Income in 2019 for the Model Containing Only the Controls and the Model That Also Included Admiration, Rivalry, and Risk Attitude

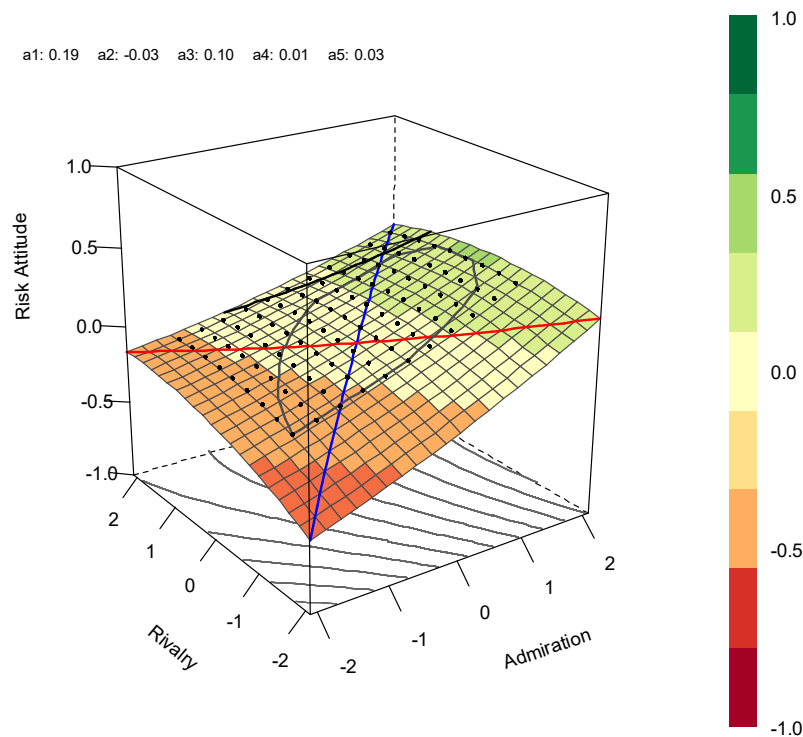
Model	RMSE	Lower 95% CI	Upper 95% CI	<i>n</i>
(1) Only covariates	0.64538	0.63704	0.65394	11215
(2) Including admiration, rivalry, risk attitude	0.64543	0.63709	0.65399	11215

The comparison of RMSE indicates that adding admiration, rivalry, and risk attitude to the control variables did not change the predictive validity significantly.

Supplement I – Exploratory analyses: Response surface analyses

Figure S2

Response Surface Analysis for Admiration and Rivalry as Predictors of Risk Attitude



Note. The response surface shows the line of congruence (blue), the line of incongruence (red), and a bag plot with predicted data points. The bag plot shows 50% of the data in the inner bag and 50% in the outer region.

Table S12

Results of the Weighted Polynomial Regression Analysis for Admiration and Rivalry as Predictors of Risk Attitude

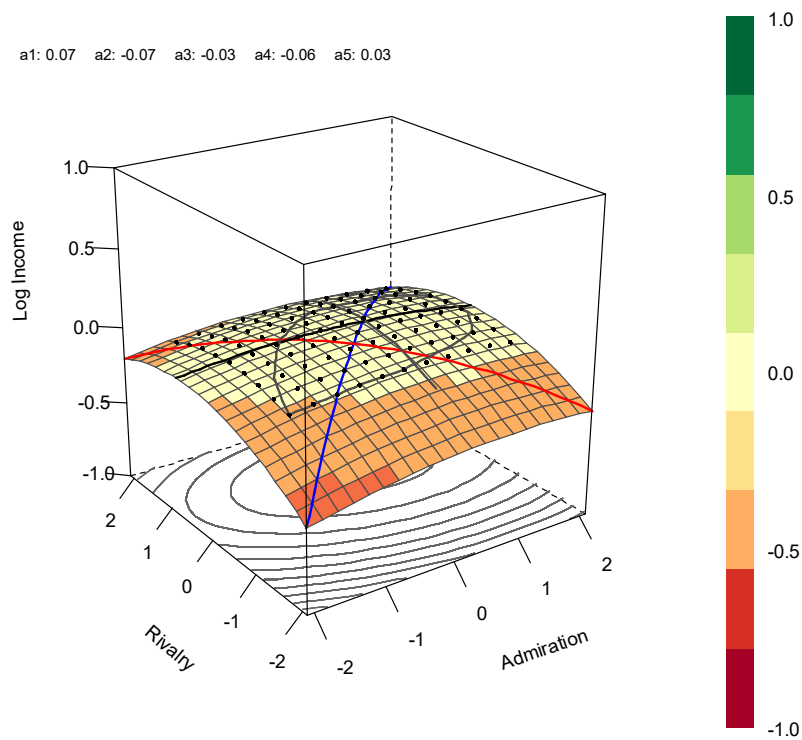
Predictors	<i>B</i>	<i>SE</i>	<i>t</i>
Admiration (b_1)	0.15** (0.15, 0.15)	0.000	784.606
Rivalry (b_2)	0.05** (0.05, 0.05)	0.000	153.018
Curvilinear admiration (b_3)	0.01** (0.01, 0.01)	0.000	85.795
Admiration * Rivalry (b_4)	-0.02** (-0.02, -0.02)	0.000	-95.193
Curvilinear rivalry (b_5)	-0.001** (-0.001, -0.001)	0.000	-4.734
Response surface parameters			
a_1	0.194** (0.194, 0.195)	0.000	684.60
a_2	-0.012** (-0.011, -0.0108)	0.000	-59.635
a_3	0.100** (0.099, 0.101)	0.000	235.444
a_4	0.032** (0.031, 0.033)	0.000	72.251
a_5	0.013** (0.012, 0.013)	0.000	49.395

Note. Predictors were grand-mean-centered for the analysis. Regression coefficients b_1 to b_5 refer to the full polynomial model $Z = b_0 + b_1A + b_2R + b_3A^2 + b_4AR + b_5R^2$, whereas A is Admiration and R is Rivalry. Note that R^2 is not available in a probit regression.

* $p < .05$. ** $p < .01$.

Figure S3

Response Surface Analysis for Admiration and Rivalry as Predictors of Income



Note. The response surface shows the line of congruence (blue), the line of incongruence (red), and a bag plot with predicted data points. The bag plot shows 50% of the data in the inner bag and 50% in the outer region.

Table S13

Results of Weighted Polynomial Regression Analysis for Admiration and Rivalry as Predictors of Income

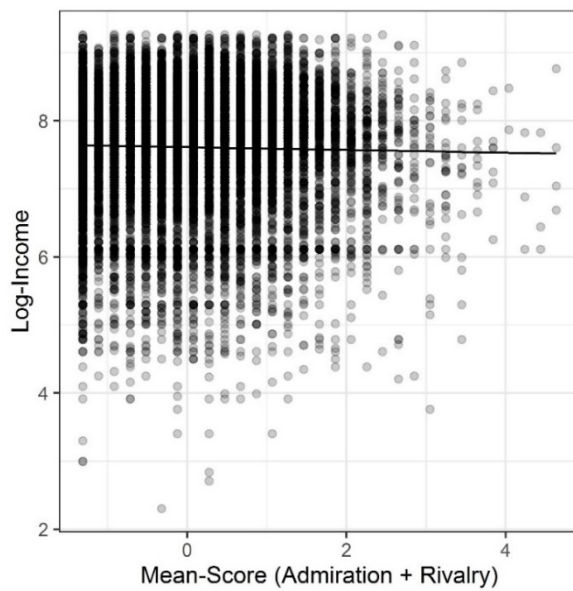
Predictors	<i>B</i>	<i>SE</i>
Intercept	7.706** (7.69, 7.73)	0.010
Admiration (<i>b</i> ₁)	0.022** (0.01, 0.04)	0.008
Rivalry (<i>b</i> ₂)	0.049** (0.02, 0.08)	0.013
Curvilinear admiration (<i>b</i> ₃)	-0.02** (-0.03, -0.01)	0.006
Admiration * Rivalry (<i>b</i> ₄)	-0.01 (-0.03, 0.01)	0.010
Curvilinear rivalry (<i>b</i> ₅)	-0.05** (-0.07, -0.03)	0.009
Response surface parameters		
<i>a</i> ₁	0.071** (0.047, 0.094)	0.012
<i>a</i> ₂	-0.074** (-0.090, -0.058)	0.008
<i>a</i> ₃	-0.027 (-0.063, 0.008)	0.018
<i>a</i> ₄	-0.060** (-0.097, -0.022)	0.019
<i>a</i> ₅	0.033** (0.011, 0.054)	0.011
<i>R</i> ² _{adj.}		0.01

Note. Predictors were grand-mean-centered for the analysis. Regression coefficients *b*₁ to *b*₅ refer to the full polynomial model $Z = b_0 + b_1A + b_2R + b_3A^2 + b_4AR + b_5R^2$, whereas *A* is Admiration and *R* is Rivalry.

p* < .05. *p* < .01.

Supplement J – Exploratory analyses: Level-and-difference approach**Figure S4**

Scatterplot of the Standardized Mean Score of Narcissistic Admiration and Rivalry in Predicting Income

**Figure S5**

Scatterplot of the Standardized Difference Score of Narcissistic Admiration and Rivalry in Predicting Income

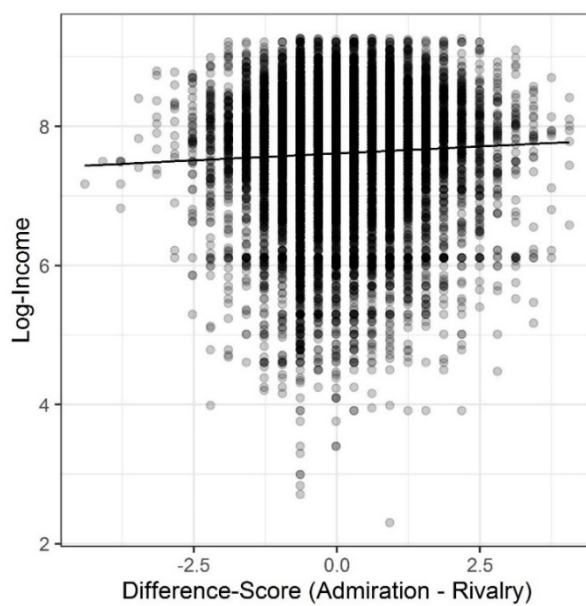
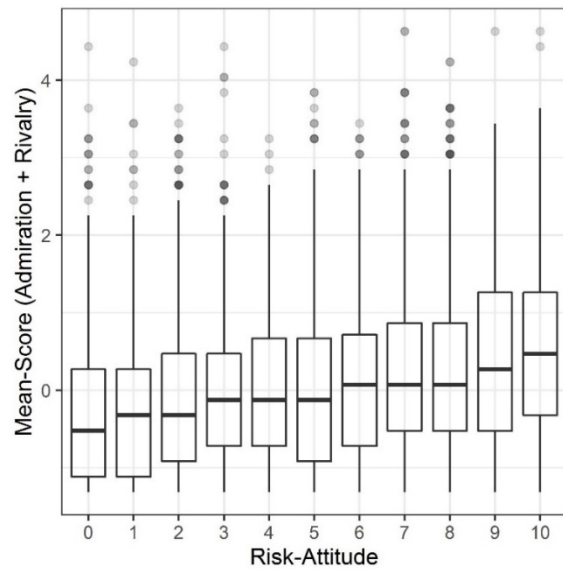


Figure S6

Boxplot of the Standardized Mean Score of Narcissistic Admiration and Rivalry in Predicting Risk Attitude

**Figure S7**

Boxplot of the Standardized Difference Score of Narcissistic Admiration and Rivalry in Predicting Risk Attitude

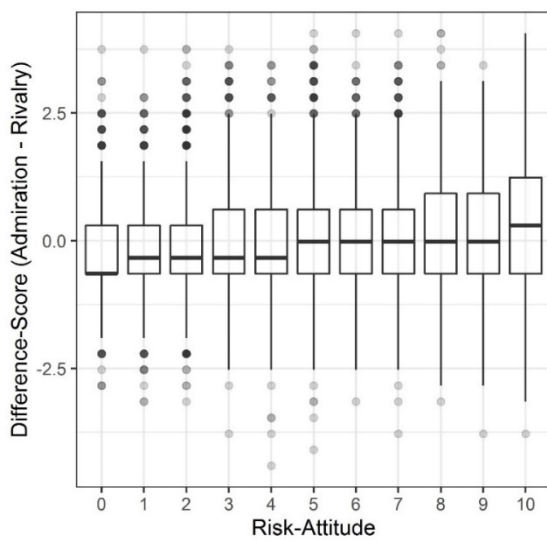


Table S14*Exploratory Level-and-Difference-Approach Regression Analysis for Predicting Risk Attitude***Standardized Regression on Risk Attitude: Level-and-Difference Approach**

	<i>Dependent variable:</i>
	Risk attitude
Mean-Score (adm + riv)	0.11 ^{***} (0.09, 0.13)
Difference-Score (adm - riv)	0.08 ^{***} (0.06, 0.10)
Age	-0.11 ^{***} (-0.13, -0.09)
Female	-0.20 ^{***} (-0.21, -0.18)
Observations	14,473

* $p < .10$. ** $p < .05$. *** $p < .01$.

Table S15*Exploratory Level-and-Difference Approach Regression Analysis for Predicting Log-Income***Standardized regression predicting income: level-and-difference approach**

	<i>Dependent variable:</i>
	Logged gross income
Mean score (adm + riv)	-0.02*** (-0.03, -0.01)
Difference score (adm - riv)	0.04*** (0.03, 0.05)
Age	0.10*** (0.09, 0.11)
Female	-0.03*** (-0.04, -0.02)
Full-time	0.55*** (0.54, 0.56)
Risk attitude	-0.01** (-0.02, -0.001)
Constant	7.61*** (7.60, 7.62)
Observations	14,473
R ²	0.42
Adjusted R ²	0.42
Residual Std. Error	0.67 (df = 14466)
F Statistic	1,767.51*** (df = 6; 14466)
<i>Note:</i>	*p<0.1; ** p<0.05; ***p<0.01

As suggested by a reviewer, we also tested for suppression effects (Seidman et al., 2020). We checked the bivariate distribution of admiration and rivalry (see Supplement E) but did not observe the pattern mentioned in Seidman et al. (2020).

Furthermore, Seidman et al. suggested that researchers should compare the results of three estimation methods (correlations; multiple regression; multiple regression with the level-and-difference approach; Iida et al., 2018) to find suppression effects and to interpret the

information about admiration and rivalry in a meaningful way. As the analysis was exploratory, we did not carry out weighted correlations or regressions for the suppression effects. Comparing the correlations between admiration, rivalry, and log-income with standardized regression coefficients showed that the direction and magnitude of the relationship between admiration and income remained the same when we controlled for rivalry. However, the correlation between rivalry and log-income changed. The correlation was very small and positive ($r = .099$), whereas the regression coefficient was negative ($\beta = -0.039$), so when we controlled for admiration, the association between rivalry and income changed direction and lost some of its magnitude.

We carried out a standardized regression (see Supplement H, Table 5; for scatterplots, see Supplement F) in which one predictor was the mean of admiration and rivalry (showing the common level of admiration and rivalry in individuals) and the other predictor was the difference between admiration and rivalry (reflecting the asymmetry in these two narcissistic facets; the higher an individual's difference score, the higher displayed admiration was relative to displayed rivalry, and the lower the difference between displayed admiration and rivalry) in predicting log-income. The mean score had a small negative effect ($\beta = -0.02$), and the coefficient for the difference score was small and positive ($\beta = 0.038$), meaning that individuals who show higher levels of admiration relative to rivalry have a slight advantage in terms of income, whereas having a high score overall is weakly associated with a lower income (see Figure 2c for the plot). For this reason, not taking into account the relative strengths of rivalry and admiration may lead to an underestimation of the positive association between admiration and income. This observation is complementary to our main finding of a negative association between rivalry and income and a positive association between

admiration and income. The scatterplot in Figure 2c also shows that our data are not symmetrically distributed.

We also checked for suppression effects for admiration and rivalry in predicting risk attitude (see Supplement H, Table 4; for boxplots, see Supplement G). The correlation between admiration and risk attitude ($r = .174$) pretty much resembled the standardized regression coefficient ($\beta = 0.16$). The correlation between rivalry and risk attitude was very small ($r = .099$), and the regression coefficient had changed direction ($\beta = -0.008$), but it was not statistically significant. The regression analysis with the standardized mean score of admiration and rivalry ($\beta = 0.11$) showed that people with higher overall narcissism scored higher on risk attitude, whereas those with higher levels of admiration relative to their rivalry levels scored higher on risk attitude (difference score $\beta = 0.08$). Therefore, the interpretation of the multiple regression analysis with absolute levels of admiration and rivalry may lead to an underestimation of the positive association between rivalry and risk attitude.