

Power motivations and risk sensitivity and tolerance.

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Abstract

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

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1 Introduction

Throughout political history, tyrants, and despots have influenced great power over large swaths of land and communities. One common thread amongst these individuals is how they wield their great power, often through dominant tactics such as threats and political subversion. Recent history has shown with individuals like Donald Trump, Kim Jong-Un, and Rodrigo Duterte who display authoritarian traits often wield their power through fear and threats of violence (Bernstein, 2020; Bynion, 2018; Kirby, 2021). How this power is wielded is often different for each individual. Some individuals such as Duterte and Bolsonaro wielded their power more dramatically than the likes of Trump. Individuals wielding power need not be tyrants such as the former (Riley, 1997). Individuals like Angela Merkel used her position and leadership skills to be a world leader in most negotiations. While individuals more well known for their status, demonstrated their power through prestige motives. To better understand how individuals such as world leaders or opinion makers gain and wield their power over others. Research in this field is often difficult to research yet strides have

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24 been made to understand power, namely through research in moral judgment and
 25 decision-making such as power orientation.

26 **1.1 Dominance, Prestige, and Leadership orientation**

27 Research in power desire motives has focused on three subdomains: dom-
 28 inance, leadership, and prestige (Suessenbach et al., 2019). Each of these three
 29 different power motives is explained as to different ways or methods that individ-
 30 uals in power sought power or were bestowed upon them. Often these dominant
 31 individuals will wield their power with force and potentially cause risk to them-
 32 selves to hold onto that power.

33 **1.1.1 Dominance**

34 The dominance motive is one of the more researched methods and well-
 35 depicted power motives. Individuals with a dominant orientation display the more
 36 primal of human behavior. These individuals will seek power through direct meth-
 37 ods such as asserting dominance, control over resources, or physically assaulting
 38 someone (M. W. Johnson & Bruner, 2012; Winter, 1993). Early research in dom-
 39 inance motives has shown that acts of dominance ranging from asserting physical
 40 dominance over another to physical displays of violence has been shown in many
 41 mammalian species, including humans (Petersen et al., 2018; Rosenthal et al.,
 42 2012).

43 Individuals high in dominance are often high in Machiavellianism, narcis-
 44 sism, and often are prone to risky behavior (discussion further in the next section).
 45 Continued research has hinted at a possible tendency for males to display these
 46 dominant seeking traits more than females (Bareket & Shnabel, 2020; Sidanius
 47 et al., 2000). When high dominance individuals assert themselves they are doing
 48 so to increase their sense of power (Anderson et al., 2012; Bierstedt, 1950). As-
 49 serting one's sense of dominance over another can be a dangerous task. In the
 50 animal kingdom, it can often lead to injury. While, humans asserting dominance
 51 can take a multitude of actions such as leering behaviors, physical distance, or
 52 other non-verbal methods to display dominance (Petersen et al., 2018; Witkower
 53 et al., 2020). Power from a dominant perspective is not always bestowed upon
 54 someone. The results of these expressions of dominance is not often given by the
 55 other or conceded from the less powerfull or dominant person but is taken by
 56 those with more dominance. Dominant actions or taking power in a dominant
 57 way can often lead to phsycial, emotional, and psychologically violent.

58 **1.1.2 Prestige**

59 Contrary to the dominant motivation of using intimidation and aggression
 60 to gain more power, a prestige motivation or prestige, in general, is bestowed
 61 upon an individual from others in the community (Maner & Case, 2016; Suessen-
 62 bach et al., 2019). Different from dominance motivation, prestige motivation
 63 is generally unique to the human species (Maner & Case, 2016). Due in part
 64 to ancestral human groups being smaller hunter-gatherer societies, individuals
 65 that displayed and used important behaviors beneficial to the larger group were
 66 often valued and admired by the group. Therein, the social group bestows the
 67 authority onto the individual. Generally, this type of behavior can be passively
 68 achieved by the prestigious individual. However, this does not remove the intent
 69 of the actor in that they too can see prestige from the group, but the method
 70 of achieving that social status greatly differs from that of dominance-seeking
 71 individuals.

72
 73 Apart from dominance-motivated individuals that continually have to fight
 74 for their right to have power over others, individuals that seek or were given power
 75 through a prestige motivation are not generally challenged in the same sense as
 76 dominant individuals. Displaying behaviors that the community would see as
 77 beneficial would endear them into the community making the survival of the
 78 community as a whole better (Maner & Case, 2016). Evolutionarily this would
 79 increase the viability of the prestigious individual and their genes. Similar to
 80 the dominance perspective, the prestige perspective overall increases the power
 81 and future survivability of the individual. However, due to the natural difference
 82 between prestige and dominance, dominance-seeking individuals are challenged
 83 more often resulting in more danger to their position (M. W. Johnson & Bruner,
 84 2012).

85 **1.1.3 Leadership**

86 With a shared goal a leader is someone that takes initiative and attracts
 87 followers for that shared goal (Van Vugt, 2006). Leadership is an interesting
 88 aspect of behavior in that it is almost exclusive to human interaction. Dis-
 89 cussions by evolutionary psychologists point to the formation of early human
 90 hunter-gatherer groups where the close interconnectedness created a breeding
 91 ground for leadership roles. As early humans began to evolve it would become
 92 advantageous for individuals to work together for a common goal (King et
 93 al., 2009). Often, individuals with more knowledge of a given problem would
 94 demonstrate leadership and take charge or be given power. Multiple explanations

95 of the evolution of leadership exist such as coordination strategies, safety, along
96 with evidence for growth in social intelligence in humans (King et al., 2009; Van
97 Vugt, 2006).

98

99 An interesting aspect of leadership motivation is the verification of the
100 qualities of the leader by the communities. Individuals that are often put into
101 leadership roles or take a leadership role often display the necessary goals, qual-
102 ities, and knowledge to accomplish the shared/stated goal. However, this is not
103 always the case especially for those charismatic leaders where they could stay
104 on as a leader longer than the stated goal requires (Vugt & Ronay, 2014). Tra-
105 ditionally, leadership was thought to be fluid in that those with the necessary
106 knowledge at the time would be judged and appointed as the leader. However,
107 these charismatic leaders use their charisma, uniqueness, nerve, and talent to hold
108 onto their status. ## Risk

109 Every time people leave the relative safety of their home, every decision
110 they make they are taking some form of risk. Financial risk is often discussed
111 in the media usually concerning the stock market. However, the risk is not
112 just present in finances but also in social interactions such as social risk, sexual
113 risk, health and safety risk, recreational, and ethical risks (Breakwell, 2007;
114 Kühberger & Tanner, 2009; Shearer et al., 2005; Weber et al., 2002). Each
115 individual is different in their likelihood and perception of participating in those
116 risks. Some will be more inclined to be more financially risky while others would
117 risk their health and safety.

118

119 Whether to engage in a risky situation is very complex depending on a
120 cost-benefit analysis (P. S. Johnson et al., 2015). Do the positives outweigh
121 the negatives? In practice, not all individuals will do a cost-benefit analysis of
122 a risky situation. Often, the timing of an event makes such an analysis dis-
123 advantageous. The benefits are often relative to the individual decision-maker.
124 Differences emerge in the general likelihood to engage in risky behavior such that
125 males tend to be more likely to engage in risky behaviors than their female coun-
126 terparts (Chen & John, 2021; Desiderato & Crawford, 1995). Women tended to
127 avoid risky situations except for social risks. Age is also a factor in likelihood of
128 engaging in risky situation. Often as people age we become less likely to engage
129 in certain behaviors such as financial risks but more likely to engage in social and
130 some recreational risks [citation].

131 1.2 The present study

132 The present study sought to further our understanding of dominance, pres-
133 tige, and leadership motivations in human decision-making. Furthering this, we
134 seek to bridge the connection between risk-taking behaviors, from diverse do-
135 mains, and the dominance, prestige, and leadership orientations. Following the
136 literature, we predicted that participants that were high in dominance orientation
137 would be more likely to not only engage in risky behaviors but praise the ben-
138 efits of participating in those behaviors. Individuals with prestige or leadership
139 orientation.

140 1.3 Experiment 1

141 1.4 Methods

142 Participants were a convenience sample of 111 individuals from Prolific
143 Academic’s crowdsourcing platform (www.prolific.io). Prolific Academic is an
144 online crowdsourcing service that provides participants access to studies hosted
145 on third-party websites. Participants were required to be 18 years of age or
146 older and be able to read and understand English. Participants received £4.00,
147 which is above the current minimum wage pro-rata in the United Kingdom, as
148 compensation for completing the survey. The Psychology Research Ethics Com-
149 mittee at the University of Edinburgh approved all study procedures [ref: 212-
150 2021/1]. The present study was pre-registered along with a copy of anonymized
151 data along with a copy of the R code and supplemental materials are available
152 at (<https://osf.io/s4j7y>).

153 1.5 Materials

Table 1*Experiment 1: Participant Demographics*

Characteristic	N=109
Age	
Mean (SD)	27 (9.25)
Median [Range]	24 [18.00, 61]
Gender	
Female	54 (50%)
Male	55 (50%)
Ethnicity	
African	8 (7.3%)
Asian	6 (5.5%)
English	10 (9.2%)
European	76 (70%)
Latin American	2 (1.8%)
Other	5 (4.6%)
Scottish	2 (1.8%)
Education	
A-levels or equivalent	32 (29%)
Doctoral Degree	1 (0.9%)
GCSEs or equivalent	8 (7.3%)
Prefer not to respond	1 (0.9%)
Primary School	4 (3.7%)
University Postgraduate Program	21 (19%)
University Undergraduate Program	42 (39%)

154 **1.5.1 Demographic Questionnaire**

155 In a demographic questionnaire administered prior to the main survey,
 156 participants were invited to respond to a series of questions about their self-
 157 identified demographic characteristics such as age, gender, ethnicity, and ethnic
 158 origin.

159 **1.5.2 Dominance, Prestige, and Leadership Orientation**

160 The 18-item Dominance, Prestige, and Leadership scale, DoPL (Suessen-
 161 bach et al., 2019), is used to measure dominance, prestige, and leadership ori-
 162 entation. Each question corresponds to one of the three domains. Each domain
 163 is scored across six unique items related to those domains (e.g., “I relish oppor-
 164 tunities in which I can lead others” for leadership) and rated on a scale from 0
 165 (Strongly disagree) to 5 (Strongly agree). Included in this scale are 15 masking
 166 questions obtained from the unified motives scale (Schönbrodt & Gerstenberg,

2012) consistency reliability for the current sample is $\alpha = 0.86$.

1.5.3 Domain Specific Risk-taking Scale

The 40-item Domain-Specific Risk-taking Scale, DOSPERT (Weber et al., 2002) is a scale assessing individuals' likelihood of engaging in risky behaviors within 5 domain-specific risky situations: financial ("Gambling a week's income at a casino."), social ("Admitting that your tastes are different from those of your friends"), recreational ("Trying out bungee jumping at least once"), health and safety ("Engaging in unprotected sex"), and ethical ("Cheating on an exam") situations. Each risky situation is then rated on a five-point Likert scale (1 being very unlikely and 5 being very likely). Two additional five-point Likert scales assess risk perception and expected benefits (1 being not at all risky and 5 being extremely risky; 1 being no benefits at all and 5 being great benefits) respectively. Example risky situations are "Admitting that your tastes are different from those of a friend" and "Drinking heavily at a social function." Internal consistency reliability for the current samples for the 3 sub-domains are $\alpha = 0.85$, $\alpha = 0.90$, $\alpha = 0.92$ respectively.

1.6 Procedure

Participants were recruited via a study landing page on Prolific's website or via a direct e-mail to eligible participants (Prolific Academic, 2018). The study landing page included a brief description of the study including any risks and benefits along with expected compensation for successful completion. Participants accepted participation in the experiment and were directed to the main survey (Qualtrics, Inc; Provo, UT) where they were shown a brief message on study consent.

Once participants consented to participate in the experiment they answered a series of demographic questions. Once completed, participants completed the Dominance, Prestige, and Leadership Scale and the Domain Specific Risk-taking scale. The two scales were counterbalanced to account for order effects. After completion of the main survey, participants were shown a debriefing statement that briefly mentions the purpose of the experiment along with the contact information of the main researcher (AI). Participants were compensated £4.00 via Prolific Academic.

1.7 Data analysis

Demographic characteristics were analyzed using multiple regression for continuous variables (age) and Chi-square tests for categorical variables (gender,

202 race, ethnicity, ethnic origin, and education). Means and standard deviations
 203 were calculated for the relevant scales (i.e., DoPL and DOSPERT). All analyses
 204 were done using (R Core Team, 2021) along with the (Bürkner, 2017) package.

205 The use of bayesian statistics has a multitude of benefits to statistical anal-
 206 ysis and research design. One important benefit is the use of prior data in future
 207 analyses. Termed as priors, is the use of prior distributions for future analysis.
 208 This allows for the separation of how the data might have been collected or what
 209 the intention was. In essence, the data is the data without the interpretation of
 210 the scientist.

211 All relevant analyses were conducted in a Bayesian framework using the
 212 brms package (Bürkner, 2018) along with the cmdstanr packages notes (Gabry &
 213 Cesnovar, 2021). In addition to the aforementioned packages, we used bayestestR,
 214 rstan, and papaja (Aust & Barth, 2020; Makowski et al., 2019; Stan Development
 215 Team, 2020).

216 1.8 Results

217 One hundred and eleven individuals completed the main survey. Of these
 218 individuals, 111 completed all sections without incomplete data and were there-
 219 fore retained in most data analyses. In later analyses to account for outliers, two
 220 participants had to be excluded from the dataset. Table 1 shows the demographic
 221 information for the participants. The average completion time for participants
 222 was 20M 58s ($SD = 10M\ 43s$).

223 1.8.1 Preregistered Analyses

224 We first investigated DoPL orientation on general risk preference (Figure
 225 1). General risk preference was anecdotally explained by dominance orientation,
 226 participant gender, and participant age (see table 1). General distributions of
 227 dominance, prestige, and leadership then warranted further analysis. To investi-
 228 gate the interaction of power orientation and DOSPERT we followed the methods
 229 described in the DOSPERT scoring manual found on the official DOSPERT Scale
 230 website (DOSPERT Scoring Instructions). This involves calculating the alpha
 231 and beta coefficients and then from there calculating the overall preferences for
 232 each of the subdomains and the overall domains for general risk preference along
 233 with the perception and benefit preferences for risk.

234 **1.8.1.1 Demographic and DoPL.** All participants completed the
 235 dominance, leadership, and prestige scale (Suessenbach et al., 2019). Empirically,
 236 men have generally been more dominance-oriented in their behavior (Rosenthal
 237 et al., 2012). Following the literature as well, dominant men tended to prefer risk

more so than women (95% CI $b = -3.02, [-4.97, -1.06]$). The marginal posterior distribution of each parameter is summarized in Table 1. Interestingly, older individuals tended to be more dominance-oriented than younger individuals.

1.8.1.2 General Risk and DoPL. Further investigations, as previously mentioned investigated DoPL's interactions with general risk preference. As stated, dominance appears to be the strongest predictor of general risk preference (95% CI $b = 3, [1.07, 4.9]$). Overall, younger individuals tended to have a stronger preference for risk (95% CI $b = -2.85, [-4.76, -0.95]$). Those that tended to be lower in leadership orientation had a tendency to be generally more risk averse than their counterparts (95% CI $b = -1.91, [-3.82, -0.02]$).

1.8.2 Domain-Specific Risk-Taking

As predicted individuals that identified as male were more likely to endorse risk-taking behaviors, namely ethical, social, financial, and recreational domains (see 1).

1.8.3 Interactions

When investigating dominance, prestige, and leadership motivations with domain-specific risk-taking findings supported the common expectations in the literature. Table 5 shows the interactions with like CI values. Dominance overall explained the relationship between DoPL orientation and preference, specifically (95% CI $b = 1.15, [0.61, 1.71]$, financial, $b = 0.87, [0.13, 1.58]$, social, $b = 1.81, [0.64, 2.94]$, health and safety, $b = 1.09, [0.41, 1.77]$, and recreational, $b = 1.22, [0.67, 1.76]$) respectively. Full interactions can be found in table 4. Participant age and gender also appeared to affect recreational preference (95% CI $b = -1.14, [-1.83, -0.47]$, $b = 0.46, [0.05, 0.86]$) respectively.

Following these findings, we investigated the effect of DoPL on general risk preference and found that dominance overall predicted risk preference along with gender and age of the participant (Table 4).

1.8.4 DOSPERT Sub-categorizations

Risk preferences is generally made up of benefits and perceptions of risk. Outside of perceptions and benefits, dominance and males who are dominance oriented were the strongest predictors of likelihood in engaging in a risky situation (95% CI $b = 0.65, [0.36, 0.95]$ and $b = -0.48, [-0.85, -0.11]$). Dominance also appeared to be a strong predictor of perceiving more benefits of engaging in a risky situation (95% CI $b = 0.38, [0.07, 0.71]$) along with gender where males are more likely to perceive benefits (95% CI $b = -0.6, [-0.98, -0.22]$).

273 Alternatiively, prestige appeared to be a stronger predictor of perceiving
274 risks than others along with female participants and female participants that are
275 higher in leadership orientation (95% CI $b = 0.31$, $[0.01, 0.61]$, $b = 0.43$, $[0.05,$
276 $0.8]$, and $b = 0.43$, $[0.03, 0.82]$). Full predictors can be seen in table 6.

277 **1.8.5 Discussion**

2 Experiment 2

2.1 Methods

Materials remain the same in terms of the (1) Demographic Questionnaire, (2) Dominance, Prestige, and Leadership Questionnaire, and (3) DOSPERT Questionnaire. However, we added the Brief-Pathological Narcissism Inventory to assess possible interactions of dominance and narcissism in risky decision-making.

2.2 Participants

Following experiment 1, participants were a convenience sample of 289 individuals from Prolific Academic’s crowdsourcing platform (www.prolific.io). Prolific Academic is an online crowdsourcing service that provides participants access to studies hosted on third-party websites. Participants were required to be 18 years of age or older and be able to read and understand English. In addition, similar to participant demographics in experiment 1, participants were majority white along with having a university undergraduate degree. Participants received £3.00, which is above the current minimum wage pro-rata in the United Kingdom, as compensation for completing the survey. The Psychology Research Ethics Committee at the University of Edinburgh approved all study procedures [ref: 212-2021/2]. The present study was pre-registered along with a copy of anonymized data and a copy of the R code is available at (<https://osf.io/s4j7y>).

2.3 Materials

2.3.1 Brief-Pathological Narcissism Inventory

The 28-item Brief Pathological Narcissism Inventory (B-PNI; Schoenleber et al. (2015)) is a modified scale of the original 52-item Pathological Narcissism Inventory (PNI; Pincus et al. (2009)). Like the PNI, the B-PNI is a scale measuring individuals’ pathological narcissism. Items in the B-PNI retained all 7 pathological narcissism facets from the original PNI (e.g., exploitativeness, self-sacrificing self-enhancement, grandiose fantasy, contingent self-esteem, hiding the self, devaluing, and entitlement rage). Each item is rated on a 5-point Likert scale ranging from 1 (not at all like me) to 5 (very much like me). Example items include “I find it easy to manipulate people” and “I can read people like a book.” B-PNI was well correlated within itself 0.90 along with strong internal consistency within the sub-domains of pathological narcissism, i.e., α ’s for Grandiosity (0.79) and Vulnerability (0.89).

Table 2*Experiment 2: Participant Demographics*

Characteristic	N=279
Age	
Mean (SD)	29 (9.84)
Median [Range]	26 [18.00, 78]
Gender	
Female	124 (43%)
Gender Non-Binary	8 (2.8%)
Male	155 (54%)
Prefer not to respond	2 (0.7%)
Ethnicity	
African	51 (18%)
Asian or Asian Scottish or Asian British	5 (1.7%)
Mixed or Multi-ethnic	7 (2.4%)
Other ethnicity	3 (1.0%)
Prefer not to respond	1 (0.3%)
White	222 (77%)
Education	
A-Levels or Equivalent	65 (22%)
Doctoral Degree	4 (1.4%)
GCSEs or Equivalent	18 (6.2%)
Prefer not to respond	5 (1.7%)
Primary School	5 (1.7%)
University Post-Graduate Program	62 (21%)
University Undergraduate Program	130 (45%)
Ethnic Origin	
African	50 (17%)
Asian	7 (2.4%)
English	16 (5.5%)
European	200 (69%)
Latin American	6 (2.1%)
Other	10 (3.5%)

311 2.4 Procedure

312 Participants were recruited via a study landing page on Prolific’s website
 313 or via a direct e-mail to eligible participants (Prolific Academic, 2018). The study
 314 landing page included a brief description of the study including any risks and ben-
 315 efits along with expected compensation for successful completion. Participants
 316 accepted participation in the experiment and were directed to the main survey
 317 on pavlovia.org (an online JavaScript hosting website similar to Qualtrics) where
 318 they were shown a brief message on study consent.

319 Once participants consented to participate in the experiment they an-
 320 swered a series of demographic questions. Once completed, participants com-
 321 pleted the Dominance, Prestige, and Leadership Scale and the Domain Specific
 322 Risk-taking scale. An additional survey was added (the novel aspect of experi-
 323 ment 2) where participants, in addition to the two previous surveys, were asked to
 324 complete the brief-pathological narcissism inventory. The three scales were coun-
 325 terbalanced to account for order effects. After completion of the main survey,
 326 participants were shown a debriefing statement that briefly mentions the purpose
 327 of the experiment along with the contact information of the main researcher (AI).
 328 Participants were compensated £3.00 via Prolific Academic.

329 2.5 Data analysis

330 Demographic characteristics were analyzed using multiple regression for
 331 continuous variables (age) and Chi-square tests for categorical variables (gender,
 332 race, ethnicity, ethnic origin, and education). Means and standard deviations
 333 were calculated for the relevant scales (i.e., DoPL and DOSPERT). All analyses
 334 were done using (R Core Team, 2021) along with the (Bürkner, 2017) package.

335 The use of bayesian statistics has a multitude of benefits to statistical anal-
 336 ysis and research design. One important benefit is the use of prior data in future
 337 analyses. Termed as priors, is the use of prior distributions for future analysis.
 338 This allows for the separation of how the data might have been collected or what
 339 the intention was. In essence, the data is the data without the interpretation of
 340 the scientist.

341 All relevant analyses were conducted in a Bayesian framework using the
 342 brms package (Bürkner, 2018) along with the cmdstanr packages notes (Gabry &
 343 Cesnovar, 2021). In addition to the aforementioned packages, we used bayestestR,
 344 rstan, and papaja for analysis along with the creation of this manuscript (Aust
 345 & Barth, 2020; Makowski et al., 2019; Stan Development Team, 2020).

2.6 Results and Discussion

Two hundred and eighty-nine individuals participated in the present experiment. Of those 54% identified as male ($n = 155$). Table 3 shows the demographic information for Experiment 2. Furthering, table 4 illustrates a Bayesian correlational matrix of all the measures wherein content-based similar measures illustrated positive and negative correlations consistent with expectations. The average completion time for participants was 21M 10.61S ($SD = 9M 51.56S$)

In general, male participants were more likely to endorse dominance-oriented statements, (95% CI $b = 0.27$, $[0.03, 0.51]$). Along with younger individuals tending to also endorse dominant-oriented statements, (95% CI $b = -0.02$, $[-0.03, 0]$).

2.6.1 Preregistered Analyses

2.6.1.1 Dominance. Following the previous basic results, we began our pre-regisetered analysis found in the pre-registration found on OSF.io. Dominance-oriented individual was a strong predictor of multiple domains of risk-taking. Namely, participants that have a preference for both financial and social risk-taking, (95% CI $b = 0.28$, $[0.07, 0.49]$) and (95% CI $b = 0.06$, $[-0.13, 0.27]$) respectively. Investigating gender differences and found that males with a preference for financial risk-taking were more likely to endorse dominant-oriented statements, (95% CI $b = -0.18$, $[-0.45, 0.08]$).

2.6.1.2 Prestige. Differentiating between DoPL domains, males with a preference for social risk-taking were more likely to endorse prestige-oriented statements along with individuals with a general preference for social risk-taking, (95% CI $b = -0.05$, $[-0.31, 0.2]$) and (95% CI $b = 0.03$, $[-0.16, 0.22]$) respectively.

2.6.1.3 Leadership. Finally, leadership orientation follows a similar trend seen with dominance and prestige orientations. Males with a preference for social risk-taking were more likely to endorse leadership-oriented statements along with individuals with a less of a preference for recreational risk-taking endorsing leadership-oriented statements, (95% CI $b = 0.04$, $[-0.2, 0.28]$) and (95% CI $b = 0.17$, $[-0.01, 0.35]$) respectively.

2.6.2 Brief-Pathological Narcissism Inventory

We furthered our analyses, as seen in the pre-registration found on OSF.io by investigating pathological narcissism and its components through the Brief-Pathological Narcissism Inventory (B-PNI). Preliminary investigations of pathological narcissism in our sample show that younger individuals on average tended

to present more narcissistic opinions (95% CI $b = -0.02$, $[-0.03, -0.01]$). The B-PNI further differentiates between grandiose and vulnerability. Interestingly, women tended to present more vulnerable narcissism traits than men (95% CI $b = -0.24$, $[-0.45, -0.03]$). Younger individuals tended to present more grandiose narcissism traits (95% CI $b = -0.01$, $[-0.02, 0]$). This same tendency for younger individuals was seen with vulnerable narcissism traits (95% CI $b = -0.02$, $[-0.03, -0.01]$).

Grandiose narcissism is then separated further into grandiose fantasy, exploitativeness, and self-sacrificing and self-enhancement. Selected findings are males tend to demonstrate more exploitativeness and younger individuals tended to present more exploitative and grandiose narcissism (95% CI $b = -0.01$, $[-0.03, 0]$) and (95% CI $b = -0.02$, $[-0.03, -0.01]$) respectively. Further analysis is shown in table 11.

Vulnerable narcissism, like grandiose narcissism, is separated further into contingent self-esteem, devaluing, entitlement rage, and hiding the self. Financial preference appears to be overall the best DOSPERT predictor of vulnerable narcissism sub-domains specifically for contingent self-esteem (95% CI $b = -0.34$, $[-0.55, -0.14]$), devaluing Men (95% CI $b = 0.05$, $[-0.21, 0.31]$), and hiding the self (95% CI $b = -0.34$, $[-0.55, -0.13]$).

2.6.3 Risk and interactions

Overall, anecdotal dominance appears to explain the overall individual perceptions, benefits, and likelihood of risk judgments (95% CI $b = -0.25$, $[-0.38, -0.11]$), (95% CI $b = 0.22$, $[0.09, 0.35]$), and (95% CI $b = 0.27$, $[0.13, 0.4]$) respectively. Similarly, when looking at further sub-categorizations of general risk preferences there does appear to be mainly a bias with regards to age, where younger individuals overall have a higher risk preference than their older counterparts.

2.6.4 Domain-Specific Risk-Taking

Looking at Domain Specific Risk-taking, we analyzed DOSPERT similarly to previous analyses. Overall, domain-specific risk-taking was explained by dominance orientation along with prestige and leadership. Interesting interactions were present with individual domains for narcissism as well.

Overall, age was an effective predictor for both grandiose and vulnerable narcissism with younger individuals tending towards being more narcissistic for both grandiose and vulnerable traits (95% CI $b = -0.02$, $[-0.03, 0]$), and (95% CI $b = -0.03$, $[-0.04, -0.02]$) respectively. Preferences for financial and males with a

Table 3

*Experiment 2 / Mediation model
comparison*

	Model	log_BF
mediation_model_1		4.97
mediation_model_2		5.87
mediation_model_3		3.08
mediation_model_4		0.00

Note. Bayesian Comparison between 4 models investigating the differences of 4 different variables as mediators.

recreational risk preference tended to express more vulnerable narcissism traits (95% CI $b = -0.27, [-0.47, -0.06]$) and (95% CI $b = -0.04, [-0.28, 0.21]$) respectively.

2.6.5 Interactions

Following traditional Bayesian models, we analyzed relationships through a Bayesian mediation model using the brms Bayesian structural equation modeling software along with its software to create a multilevel model (Bürkner, 2017, 2018). Centralized in the model is risk preference. In this exploratory model we were investigating to see what is the best predictor variable is the best mediator in our analysis. Figure 10 represents our hypothetical model of dominance being the strongest mediator.

In this model, we constructed multilevel equations where we focused on different variables being the strongest mediator. Then using the brms Bayesian r package, we then compared the models to see which mediator was indeed the strongest mediator. How hypothesis where dominance would be the strongest mediator was accepted, model 2 as shown in table 3.

3 General Discussion and Implications

4 References

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- 544

5 Figures and Tables

5.1 Figures

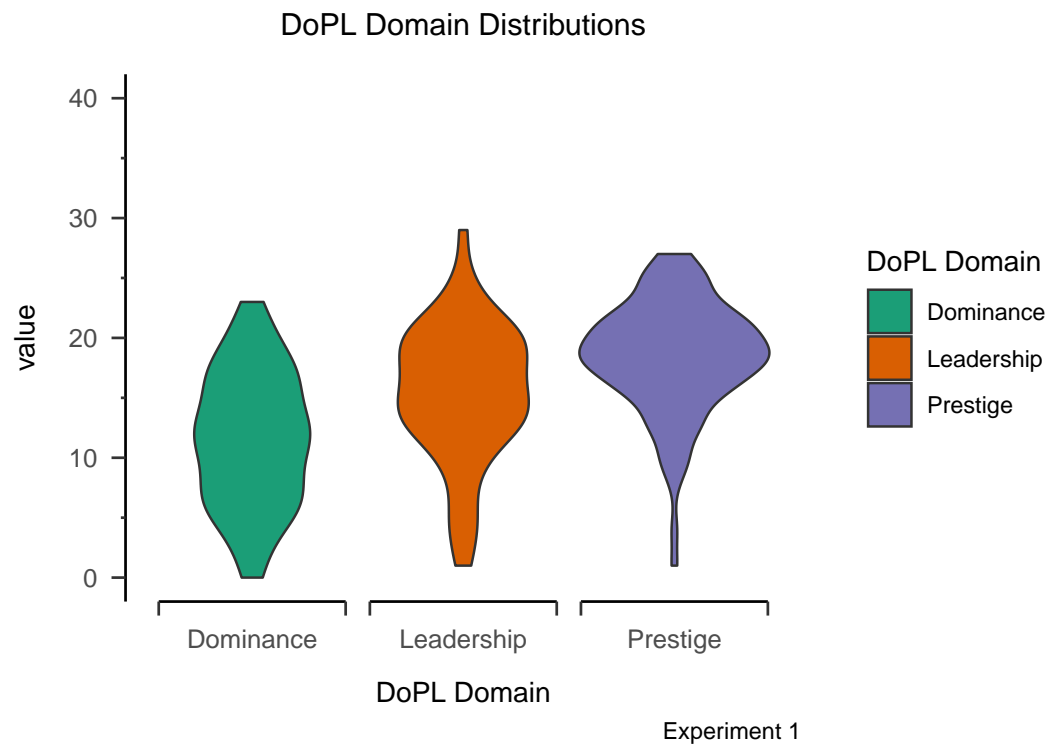


Figure 1

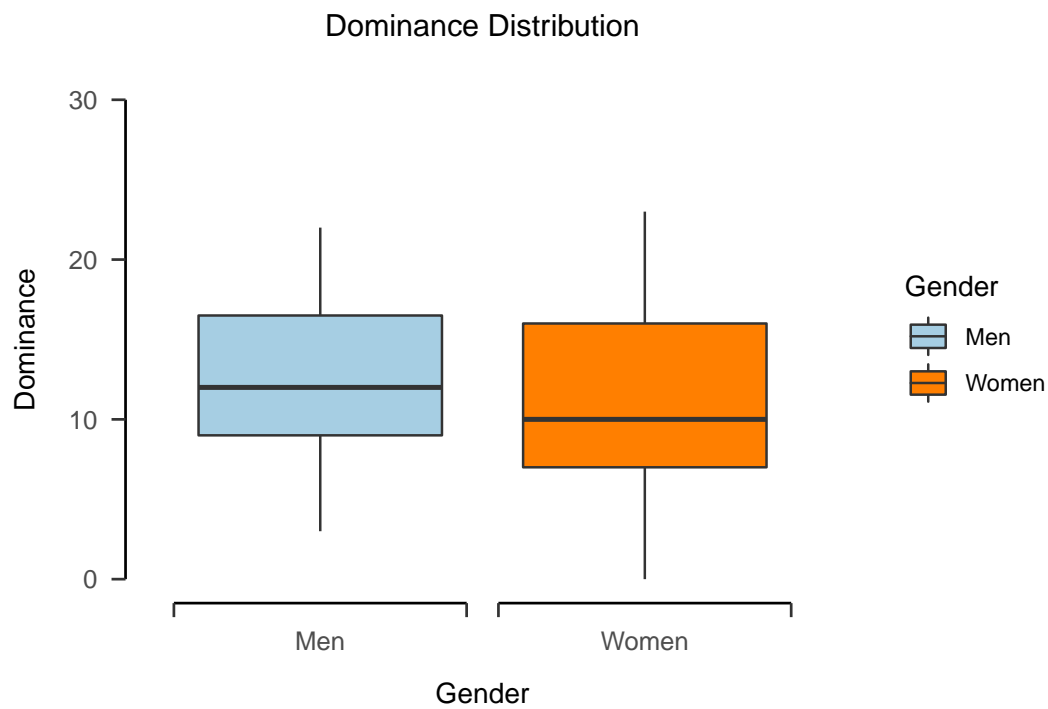


Figure 2 Experiment 1

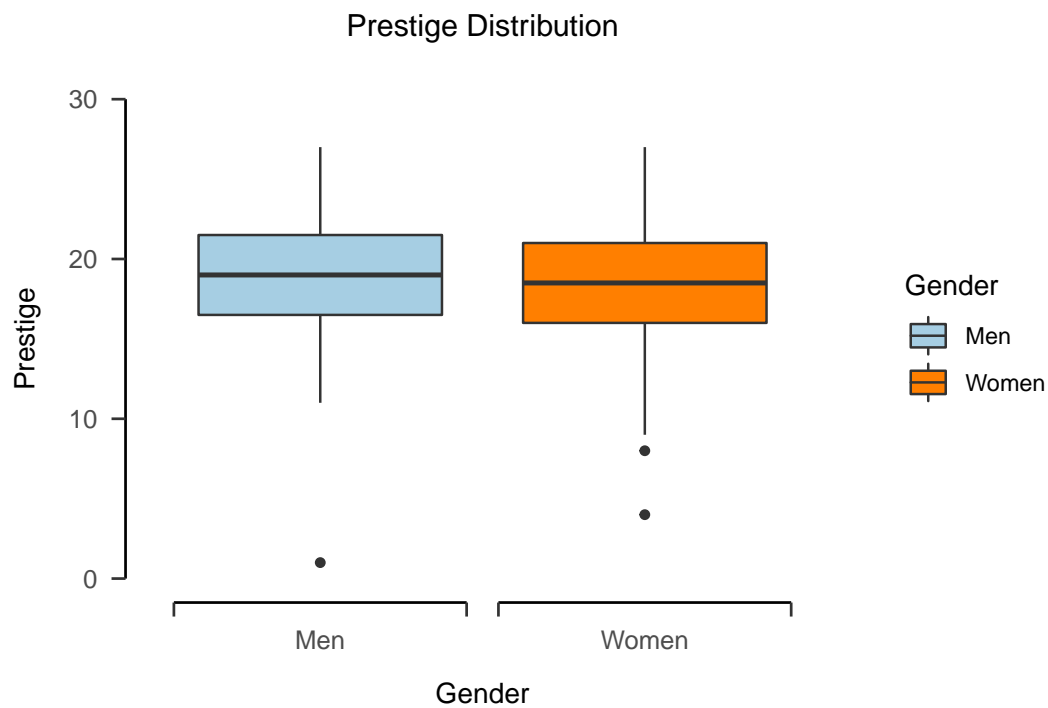


Figure 3 Experiment 1

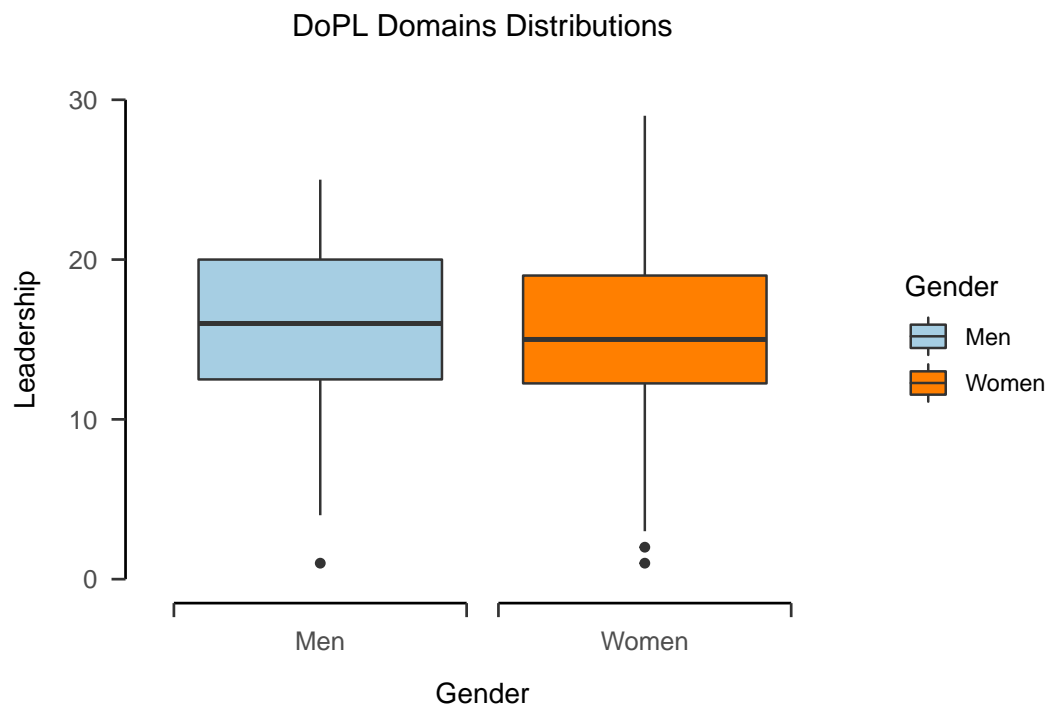


Figure 4

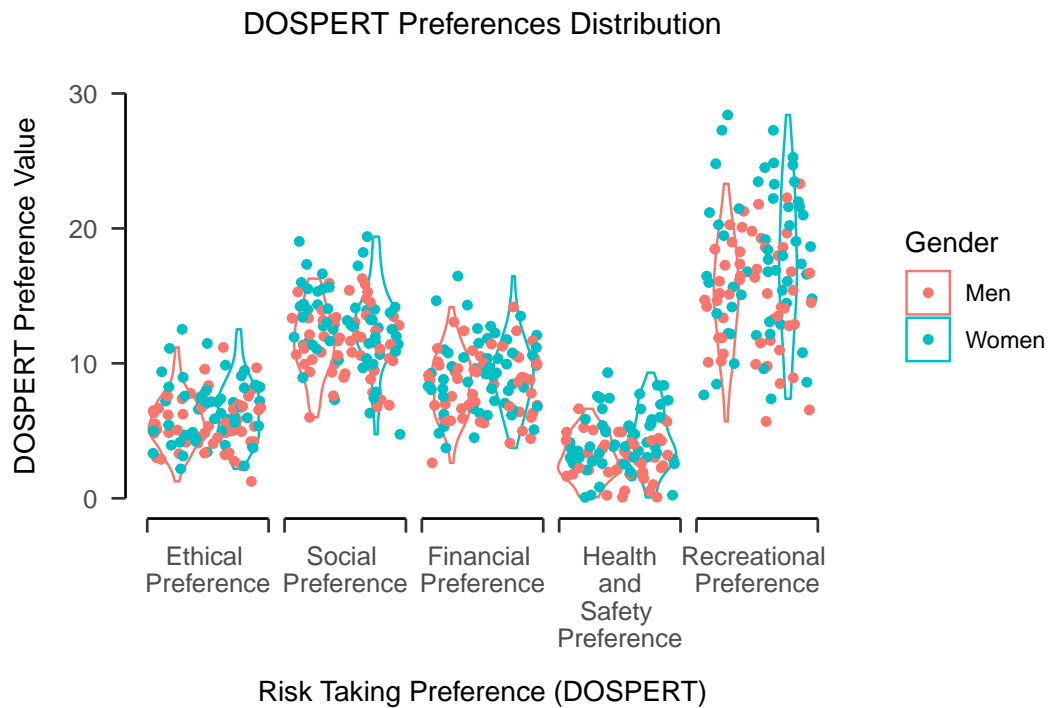


Figure 5

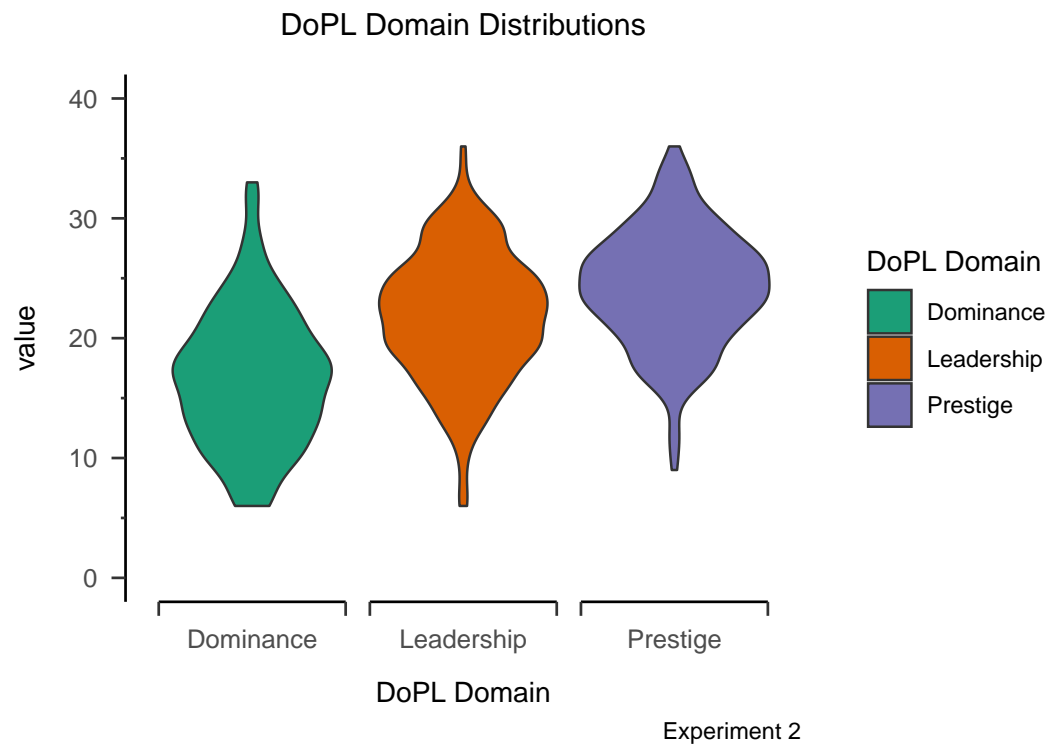


Figure 6

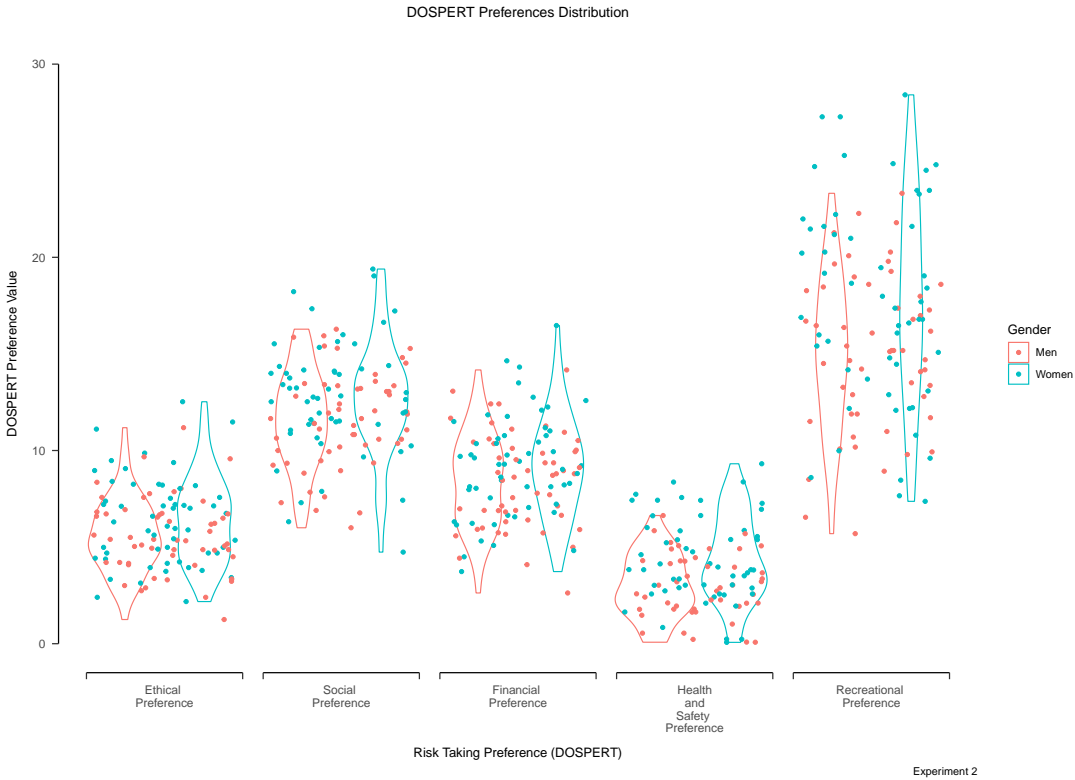
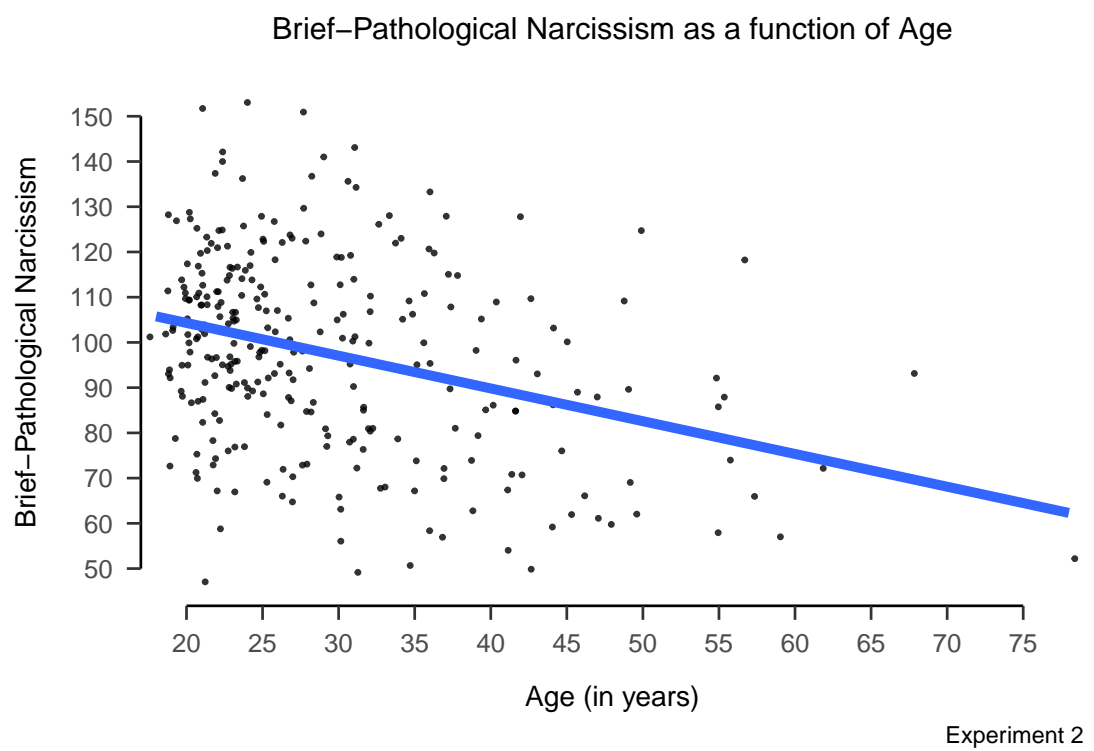


Figure 7

**Figure 8**

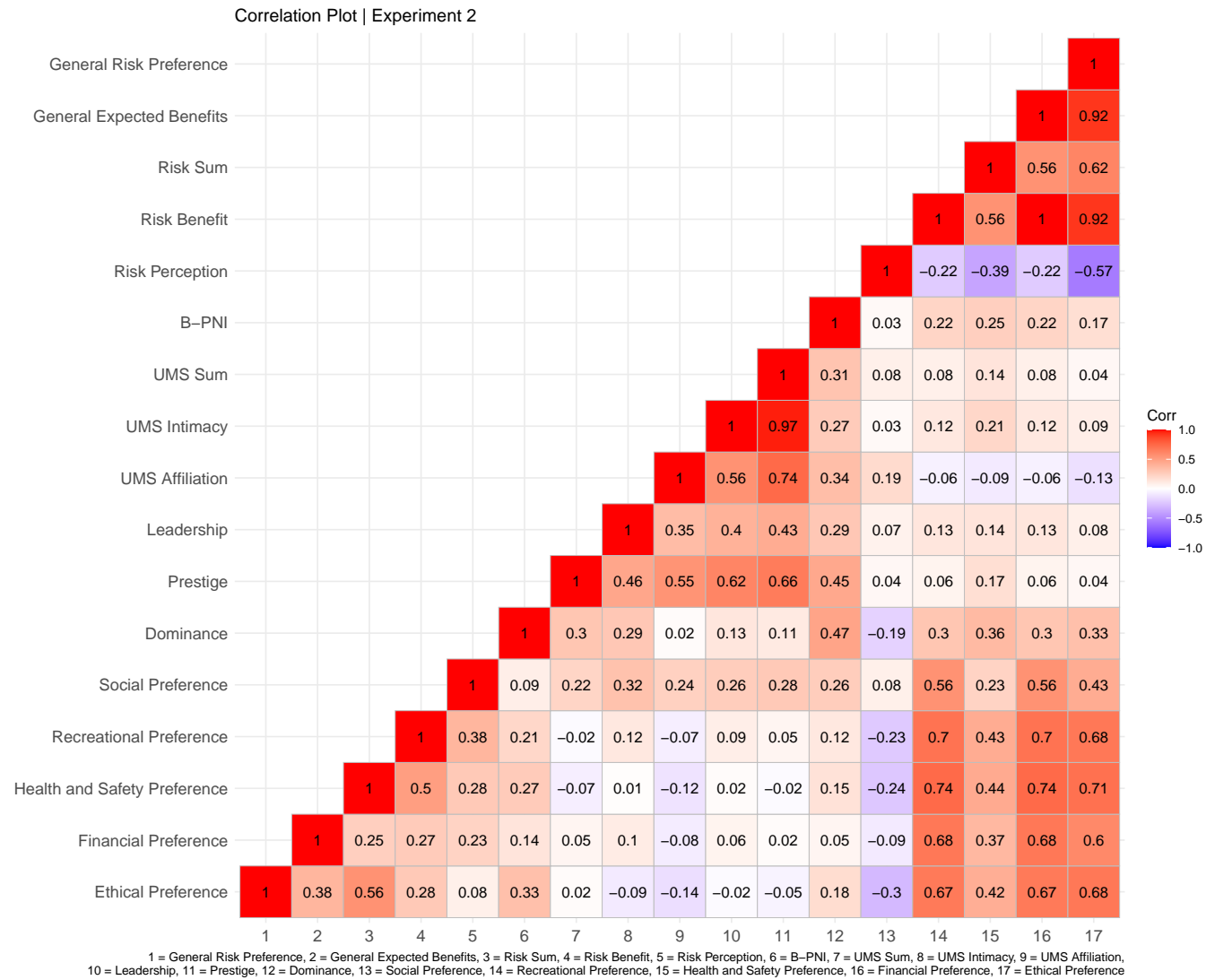


Figure 9

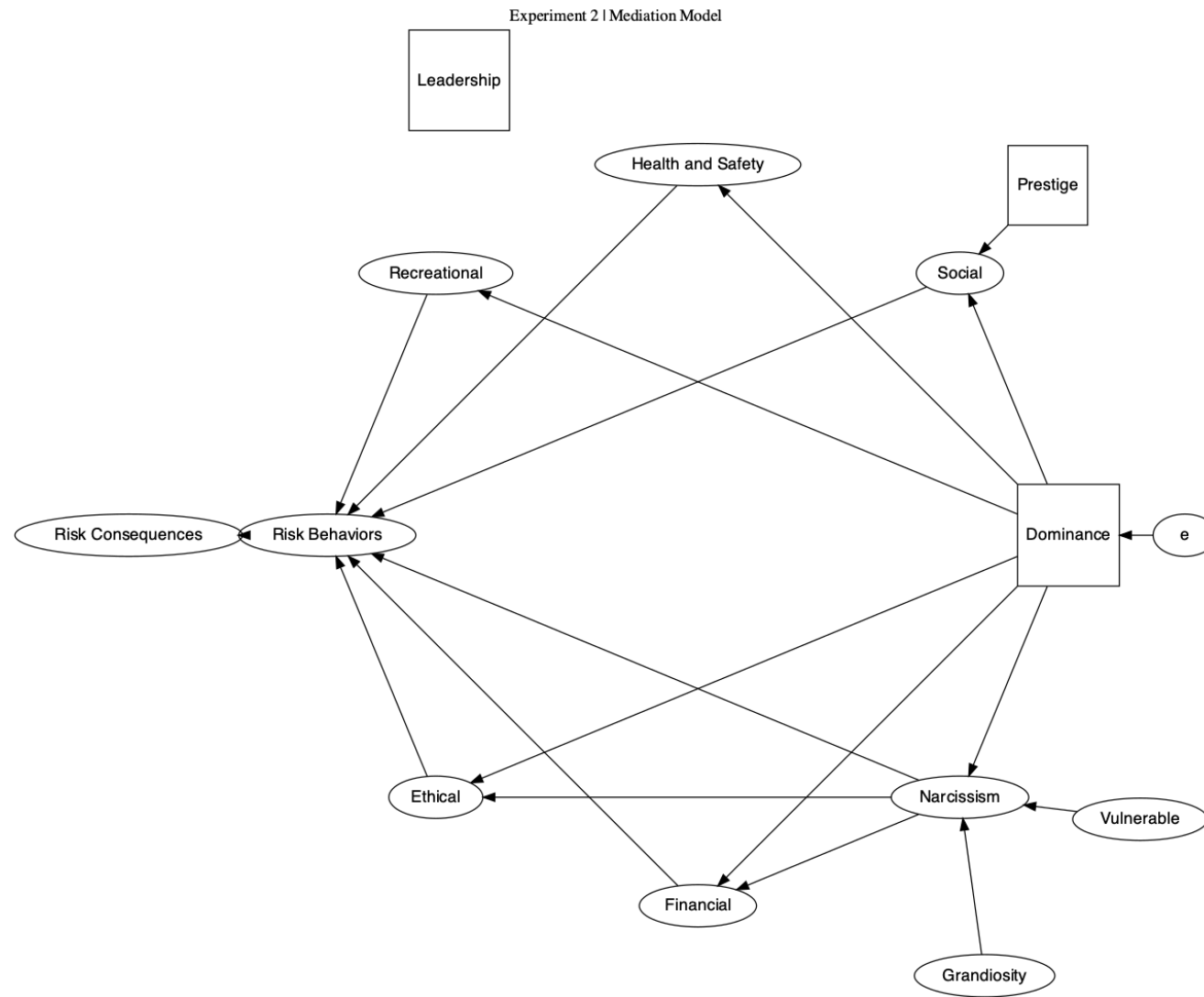


Figure 10

547 **5.2 Tables****Table 4***Fixed Effects: DoPL * General Risk*

Parameter	Estimate	CI	CI Low	CI High
Intercept	3.62	0.95	1.41	5.86
Dominance	3	0.95	1.08	4.93
Gender	-3.02	0.95	-4.95	-1.08
Age	-2.86	0.95	-4.78	-0.93

Note. Table 2 represents fixed effects, confidence intervals low and high for a basic bayesian model of Dominance, Prestige, and Leadership predicting general risk preference. Matching signs for confidence intervals is displayed in the table.

Table 5*DOSPERT and DoPL Interaction: Experiment 1*

Parameter	Estimate	CI	CI Low	CI High
Ethical Preference * Intercept	3.61	0.95	2.79	4.37
Financial Preference * Intercept	8.6	0.95	7.47	9.66
Social Preference * Intercept	9.98	0.95	8.27	11.64
Health and Safety Preference * Intercept	5.6	0.95	4.6	6.54
Recreational Preference * Intercept	1.68	0.95	0.86	2.43
Ethical Preference * Dominance	1.15	0.95	0.61	1.71
Financial Preference * Dominance	0.87	0.95	0.13	1.58
Social Preference * Dominance	1.81	0.95	0.64	2.94
Health and Safety Preference * Dominance	1.09	0.95	0.41	1.77
Recreational Preference * Dominance	1.22	0.95	0.67	1.76
Recreational Preference * Gender	-1.14	0.95	-1.83	-0.47
Recreational Preference * Age	0.46	0.95	0.05	0.86

Note. Fixed effect results of Dominance, Prestige, and Leadership with gender interactions predicting each of the individual Domain Specific Risk Taking (DOSPERT) domains.

Table 6*DOSPERT Benefit and Perception: Experiment 1*

Parameter	Estimate	CI	CI Low	CI High
Risk * Dominance	0.65	0.95	0.36	0.95
Risk * Gender	-0.5	0.95	-0.85	-0.14
Risk * Dominance : Gender	-0.48	0.95	-0.85	-0.11
Risk Perception * Gender	0.43	0.95	0.05	0.8
Risk Perception * Prestige	0.31	0.95	0.01	0.61
Risk Perception * Leadership : Gender	0.43	0.95	0.03	0.82
Risk Benefit * Dominance	0.38	0.95	0.07	0.71
Risk Benefit * Gender	-0.6	0.95	-0.98	-0.22

Note. Fixed effect results of Dominance, Prestige, and Leadership with gender interactions predicting the perceptions and benefits of risk.

Table 7*DOSPERT Benefit and Perception: Experiment 1*

Parameter	Estimate	CI	CI Low	CI High
Ethical Perception * Prestige	0.39	0.95	0.12	0.66
Recreational Perception * Prestige	0.33	0.95	0.06	0.6
Recreational Perception * Age	-0.22	0.95	-0.4	-0.04
Recreational Perception * Dominance : Gender	-0.4	0.95	-0.77	-0.04
Health and Safety Perception * Leadership : Gender	0.44	0.95	0.07	0.8

Note. Fixed effect results of Dominance, Prestige, and Leadership with gender interactions predicting the perceptions and benefits of risk.

Table 8*General Risk * DoPL: Experiment 2*

Parameter	Estimate	CI	CI Low	CI High
Intercept	0.55	0.95	0.17	0.93
Dominance	0.22	0.95	0.02	0.42
Gender	0.24	0.95	0.02	0.46
Age	-0.02	0.95	-0.04	-0.01

Note. Fixed effect results of Dominance, Prestige, and Leadership with gender interactions predicting general risk preference.

Table 9*Vulnerable and Grandiose * DoPL: Experiment 2*

Parameter	Estimate	CI	CI Low	CI High
Vulnerability * Intercept	1.01	0.95	0.57	1.45
Vulnerability * Dominance	0.44	0.95	0.08	0.8
Vulnerability * Gender	-0.23	0.95	-0.44	-0.02
Vulnerability * Prestige	0.4	0.95	0.02	0.77
Vulnerability * Age	-0.02	0.95	-0.03	-0.01
Grandiosity * Dominance	0.45	0.95	0.12	0.78

Note. Fixed effect results of Dominance, Prestige, and Leadership with gender interactions predicting two domains of narcissism, i.e., grandiose and vulnerable.

Table 10*Vulnerable Narcissism Sub-domains * DoPL: Experiment 2*

Parameter	Estimate	CI	CI Low	CI High
Dominance * Gender	0.3	0.95	0.11	0.49
Dominance * Entitlement Rage	0.28	0.95	0.08	0.47
Dominance * Exploitativeness	0.37	0.95	0.22	0.52
Dominance * Entitlement Rage : Gender	0.28	0.95	0.01	0.55
Prestige * Grandiose Fantasy	0.27	0.95	0.09	0.44
Prestige * Contingent Self-Esteem	0.2	0.95	0.02	0.38
Prestige * Hiding the Self	-0.23	0.95	-0.43	-0.03
Prestige * Self-Sacrificing Self-Enhancement	0.24	0.95	0.05	0.44
Prestige * Entitlement Rage	0.22	0.95	0.02	0.43
Prestige * Exploitativeness	0.2	0.95	0.05	0.36
Leadership * Grandiose Fantasy	0.22	0.95	0.05	0.39
Leadership * Gender	-0.32	0.95	-0.52	-0.12
Leadership * Exploitativeness	0.54	0.95	0.38	0.69
Leadership * Contingent Self-Esteem : Gender	-0.44	0.95	-0.71	-0.17
Leadership * Entitlement Rage : Gender	0.29	0.95	0.01	0.57

Note. Fixed effect results of sub-domains of vulnerable narcissism with gender interactions predicting dominance, prestige, and leadership.

Table 11*B-PNI * DOSPERT : Gender: Experiment 2*

Parameter	Estimate	CI	CI Low	CI High
Vulnerability * Intercept	0.82	0.95	0.44	1.21
Vulnerability * Financial Preference	-0.27	0.95	-0.47	-0.06
Vulnerability * Age	-0.03	0.95	-0.04	-0.02
Vulnerability * Recreational Preference : Gender	-0.34	0.95	-0.62	-0.07
Grandiosity * Gender	0.27	0.95	0.03	0.51
Grandiosity * Social Preference	0.3	0.95	0.11	0.49
Grandiosity * Recreational Preference : Gender	-0.41	0.95	-0.69	-0.13

Note. Fixed effect results of individual DOSPERT domains with gender interactions predicting vulnerable and grandiose narcissism respectively.

Table 12*General Risk * DoPL: Experiment 2*

Parameter	Estimate	CI	CI Low	CI High
Contingent Self-Esteem * Intercept	0.74	0.95	0.35	1.13
Devaluing * Intercept	0.79	0.95	0.39	1.18
Entitlement Rage * Intercept	0.7	0.95	0.3	1.09
Hiding the Self * Intercept	0.53	0.95	0.13	0.92
Contingent Self-Esteem * Financial Preference	-0.34	0.95	-0.55	-0.14
Contingent Self-Esteem * Age	-0.03	0.95	-0.04	-0.01
Contingent Self-Esteem * Financial Preference : Gender	0.27	0.95	0.01	0.52
Devaluing * Health and Safety Preference	0.28	0.95	0.05	0.52
Devaluing * Age	-0.02	0.95	-0.04	-0.01
Devaluing * Ethical Preference : Gender	0.38	0.95	0.07	0.67
Entitlement Rage * Age	-0.02	0.95	-0.04	-0.01
Hiding the Self * Financial Preference	-0.34	0.95	-0.55	-0.13
Hiding the Self * Recreational Preference	0.26	0.95	0.03	0.49
Hiding the Self * Financial Preference : Gender	0.29	0.95	0.03	0.55
Hiding the Self * Recreational Preference : Gender	-0.38	0.95	-0.66	-0.1

Note. Fixed effect results of Dominance, Prestige, and Leadership with gender interactions predicting general risk preference.

Table 13*General Correlation Matrix / Experiment 2*

Parameter	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Ethical Preference	0.68***	0.67***	0.42***	0.68***	-0.30***	0.18**	-0.05	-0.02	-0.14*	-0.1	0.02	0.33***	0.08	0.28***	0.56***	0.38***	1
Financial Preference	0.60***	0.68***	0.37***	0.68***	-0.09	0.05	0.02	0.06	-0.08	0.1	0.06	0.14*	0.23***	0.27***	0.25***	1	
Health and Safety Preference	0.71***	0.74***	0.44***	0.74***	-0.24***	0.15**	-0.02	0.02	-0.12*	0.01	-0.07	0.27***	0.28***	0.50***	1		
Recreational Preference	0.68***	0.70***	0.43***	0.70***	-0.23***	0.13*	0.05	0.09	-0.07	0.12*	-0.01	0.21***	0.38***	1			
Social Preference	0.43***	0.56***	0.22***	0.56***	0.08	0.27***	0.28***	0.27***	0.24***	0.32***	0.22***	0.09	1				
Dominance	0.33***	0.30***	0.35***	0.30***	-0.19***	0.47***	0.11*	0.13*	0.01	0.29***	0.30***	1					
Prestige	0.03	0.06	0.17**	0.06	0.05	0.45***	0.66***	0.62***	0.55***	0.46***	1						
Leadership	0.08	0.13*	0.14*	0.13*	0.07	0.29***	0.42***	0.40***	0.35***	1							
UMS Affiliation	-0.12*	-0.06	-0.09	-0.06	0.19***	0.34***	0.74***	0.56***	1								
UMS Intimacy	0.09	0.12*	0.21***	0.12*	0.03	0.27***	0.97***	1									
UMS Sum	0.04	0.08	0.14**	0.08	0.07	0.31***	1										
B-PNI	0.17**	0.22***	0.26***	0.22***	0.04	1											
Risk Perception	-0.58	-0.23***	-0.39***	-0.23***	1												
Risk Benefit	0.92***	1.00***	0.56***	1													
Risk Sum	0.62***	0.56***	1														
General Expected Benefits	0.92***	1															
General Risk Preference	1																

Note:

* denotes significance level

Figure captions

- 548
- 549 *Figure 1.* Violin plot visually showing the distribution of dominance,
 550 prestige, and leadership of participants in experiment 1. As
 551 seen in the figure, of participants within each power orienta-
 552 tion dominance oriented people are more evenly distributed
 553 while those that were more prestige and leadership oriented
 554 were tended to be more prestigious oriented than others.
- 555 *Figure 2.* Depicted is the gender distribution of Men and Women with
 556 regard to level of dominance. As can be seen, men are
 557 slightly higher in dominance than women.
- 558 *Figure 3.* Depicted is the gender distribution of Men and Women with
 559 regard to level of prestige. As can be seen, men are slightly
 560 higher in prestige than women.
- 561 *Figure 4.* Depicted is the gender distribution of Men and Women with
 562 regard to level of leadership. As can be seen, men are slightly
 563 higher in dominance than women.
- 564 *Figure 5.* Depicted is the gender distribution of Men and Women with
 565 regard to each sub-domain of the domain specific risk-taking
 566 scale.
- 567 *Figure 6.* Violin plot visually showing the distribution of dominance,
 568 prestige, and leadership of participants in experiment 1. As
 569 seen in the figure, of participants within each power orienta-
 570 tion dominance oriented people are more evenly distributed
 571 while those that were more prestige and leadership oriented
 572 were tended to be more prestigious oriented than others.
- 573 *Figure 7.* Depicted is the gender distribution of Men and Women with
 574 regard to each sub-domain of the domain specific risk-taking
 575 scale.
- 576 *Figure 8.* Scatterplot depicting pathological narcissism, using the B-
 577 PNI, as a function of age.
- 578 *Figure 9.* Depicted here is a correlation plot of the indices of exper-
 579 iment 2. The legend denotes stronger positive correlation
 580 (closer to 1 and darker red) or stronger negative correlation
 581 (closer to -1 and darker blue).
- 582 *Figure 10.* Figure represents a mediation model with Dominance as the
 583 central mediator in the model. The outcome variables being
 584 risk behaviors along with hypothetical consequences like STI
 585 and the like.