The Burden of Power: Construing Power as Responsibility (rather than as Opportunity) Alters Threat-Challenge Responses

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Abstract

Power usually lowers stress responses. In stressful situations, having high (versus low) power heightens challenge and lowers threat. Yet, even power-holders may experience threat when becoming aware of the responsibility that accompanies their power. Power-holders can construe (i.e., understand) a high-power position primarily as opportunity to "make things happen" or as responsibility to "take care of things". Power-holders construing power as responsibility (rather than opportunity) may be more likely to experience demands—like taking care of important decisions under their control—as outweighing their resources, resulting in less challenge and more threat. Four experiments with subjective and cardiovascular threat-challenge indicators support this. Going beyond prior work on structural aspects (e.g., power instability) that induce stress, we show that merely the way how power-holders *construe* their power can evoke stress. Specifically, we find that power construed as responsibility (versus opportunity) is more likely to imply a "burden" for the power-holder.

(149 words)

Keywords: Social power; construal of power; threat challenge; biopsychosocial model; cardiovascular stress

The Burden of Power: Construing Power as Responsibility (rather than as Opportunity) Alters Threat-Challenge Responses

Individuals often covet positions of power. They try to become captain of their sports team, seek to be group leader, or build their CV to qualify for management positions. High-power positions offer access to resources that others depend on (Fiske & Berdahl, 2007; Keltner, Gruenfeld, & Anderson, 2003). Power-holders may, thus, feel that they can master any situation (Fast, Gruenfeld, Sivanathan, & Galinsky, 2009; Scholl & Sassenberg, 2014). Indeed, power promotes goal-striving (Guinote, 2007b; Keltner et al., 2003), boosts well-being (Kifer, Heller, Perunovic, & Galinsky, 2013), and lowers stress (Akinola & Mendes, 2014; Mehta & Josephs, 2010; Scheepers, de Wit, Ellemers, & Sassenberg, 2012; Wirth, Welsh, & Schultheiss, 2006). As such, power can benefit the psychological and physiological functioning of those who possess it.

Yet, at times, the demands to ensure that things go well may weigh heavily on power-holders. Indeed, power-holders often seem at risk for health complaints (Byrne et al., 2014), suggesting that high power can be rather stressful (e.g., Sapolsky, 2005; for summaries see Galinsky, Rucker, & Magee, 2015; Sassenberg, Ellemers, Scheepers, & Scholl, 2014; Sturm & Antonakis, 2015). The present research argues that the way how power-holders understand, or *construe*, power plays an important role. When power-holders construe their power as responsibility (rather than as opportunity), they may better realize the demands to be met with their resources, responding with lower functioning. Accordingly, we examined if the construal of power changes *threat-challenge* responses—as indicators of power-holders' effective functioning in stressful situations (Blascovich, 2008).

How Social Power Affects Threat and Challenge

Social power is defined as asymmetric control over one's own and others' valued resources (Fiske & Berdahl, 2007). Elevated power provides relative independence, whereas low power means that one depends more on power-holders (Fiske & Berdahl, 2007; Keltner et al., 2003). Power-holders both *objectively* possess more resources (e.g., information, rewards; Fiske & Berdahl, 2007; Keltner et al., 2003) and *subjectively* perceive higher resources to master situations than the powerless; power evokes a sense of control (Scholl & Sassenberg, 2014), even over uncontrollable outcomes (Fast et al., 2009), and heightens confidence (See, Morrison, Rothman, & Soll, 2011).

This perception of resources affects how a person responds to (potentially stressful) tasks. Individuals often seek to perform well on tasks, for instance, making budgeting decisions, giving a speech, or solving ability-related tests. Such motivated performance situations imply high demands to fulfill. Individuals, here, evaluate whether they can master the task (Blascovich, 2008; Blascovich & Tomaka, 1996) by weighing perceived resources (e.g., knowledge, skills) against perceived demands (e.g., task requirements, task effort). The outcome of this evaluation results in *threat* if demands seem to outweigh resources, or in *challenge* when resources seem to match or exceed demands (Blascovich & Tomaka, 1996; Tomaka, Blascovich, Kelsey, & Leitten, 1993).

Threat and challenge imply subjective appraisals, but also specific patterns of *cardiovascular* responses while performing the (potentially stressful) task itself (Blascovich & Tomaka, 1996). Specifically, threat and challenge are evident in changes in total peripheral resistance (TPR, indexing net constriction versus dilation in the arterial system) and cardiac output (CO, the amount of blood pumped by the heart). During motivated performance, the heart starts pumping faster (heart rate, HR, increases) and with more force (pre-ejection period, PEP, decreases). In the case of *challenge*, this cardiac response is coupled with relatively low resistance (TPR)—which allows for the blood to easily flow through the body

(CO increases). In the case of *threat*, this response is coupled with vasoconstriction (higher TPR)—which leads to stable, or slightly decreased CO, compared to baseline levels. Challenge, then, implies higher efficiency of the heart in transporting oxygenated blood than threat (Blascovich, 2008; Blascovich & Tomaka, 1996); it predicts better task performance and health (Blascovich, Seery, Mugridge, Norris, & Weisbuch, 2004; Scholl, Moeller, Scheepers, Nuerk, & Sassenberg, 2017; Seery, Weisbuch, Hetenyi, & Blascovich, 2010).

Previous research established that high (vs. low) power promotes challenge and lowers threat (Akinola & Mendes, 2014; Scheepers et al., 2012). As previously outlined, power-holders possess and perceive more resources; moreover, power-holders are less focused on demands—for instance, they experience less obstacles (Whitson, Liljenquist, Galinsky, Magee, Gruenfeld, & Cadena, 2013) and less concern for how others evaluate them than the powerless (Keltner et al., 2003). Accordingly, high-power people should experience a more favorable demands-resources relation—which may explain this more effective challenge response. Yet, high power might not always elicit a stress-free or challenge state. Rather, specific circumstances limit its benefits—such as when power becomes unstable (Sapolsky, 2005; Scheepers, Röell, & Ellemers, 2015) or a person's status mismatches his/her endocrine profile (Josephs, Sellers, Newman, & Mehta, 2006). Going beyond such structural or personal circumstances, the way how power-holders *construe* power may change their level of threat and challenge.

How the Construal of High Power May Alter Threat and Challenge

By definition, high power is (high) asymmetric outcome control (Fiske & Berdahl, 2007). This control implies an *opportunity*, which we define as the possibility and freedom to "make things happen" (e.g., achieving important goals, making final decisions). Moreover, it implies *responsibility,* which we define as the privilege and inner obligation to "take care of things" (e.g., ensuring that important goals are met; Sassenberg et al., 2012, 2014; for similar

definitions, see Fiske & Berdahl, 2007; Torelli & Shavitt, 2010). Power-holders usually recognize *one* of these aspects—the opportunities or responsibilities. Specifically, they often construe power as opportunity, but can also be led to construe power as responsibility (Chen, Lee-Chai, & Bargh, 2001; De Wit et al., 2017; Scholl et al., 2017). Power-holders realizing their responsibility (vs. opportunity) take followers' advice more into account (De Wit et al., 2017) and treat others more considerately (Chen et al., 2001; Gordon & Chen, 2013; Overbeck & Park, 2006). Accordingly, power construed as responsibility (vs. opportunity) lowers selfishness and, indirectly, benefits the powerless.

Going beyond these well-known interpersonal implications, we investigate how the construal affects *power-holders* themselves. Construing power as responsibility may, in fact, entail costs for the power-holder. During motivated performance (e.g., budgeting decisions), a power-holder construing power as opportunity should perceive that s/he can manage demands by means of his/her (high) resources—resulting in high challenge. In contrast, a power-holder construing power as responsibility may realize more demands (e.g., taking care of decisions only s/he can make; ensuring others' well-being) and may perceive resources as being less sufficient to meet these demands—leading to relatively *lower* challenge. In fact, the challenge response of the latter power-holder may be similar to (though potentially slightly higher than) the response of a low-power person, who generally perceives high demands and low resources (Keltner et al., 2003). Accordingly, (only) power-holders construing their power as an opportunity—rather than as a responsibility—should respond with high challenge.

Indeed, initial evidence suggests that power as responsibility might have its 'downsides'. High power is not always attractive to possess and, especially, less so when construed as responsibility (vs. opportunity; Sassenberg et al., 2012). Following up on this, the present research examines implications for the functioning of those who already possess power. In doing so, we investigate if the way in which power-holders *construe* power changes

their threat-challenge responses, beyond the mere *level* of power (i.e., high vs. low power; Akinola & Mendes, 2014; Scheepers et al., 2012).

The Present Research

We tested our hypotheses in four studies, implementing adaptations of two established power-role manipulations (Experiment 1a and 1b; Guinote, 2007a; Scholl & Sassenberg, 2014; Weick & Guinote, 2010), power recall (Experiment 2; Galinsky, Gruenfeld, & Magee, 2003), and enacted roles with a confederate (Experiment 3). To evoke motivated performance, participants anticipated performing investments (Experiment 1a), expected to solve a test (Experiment 1b), or delivered a speech (Experiments 2-3). We assessed threat-challenge responses towards these situations with subjective appraisals (Experiments 1a and 1b) and unobtrusive, real-time cardiovascular indicators (Experiments 2 and 3). As outcomes, we focused on *relative challenge*—based on the idea that in a concrete situation, evaluating the relation between resources and demands as being more (or less) enough evokes a relative challenge (or threat) state, rather than two independent responses (Blascovich, 2008).

Importantly, we examine construal among those *high* in power. Accordingly, all studies compared high-power-as-responsibility to high-power-as-opportunity and different control conditions. To empirically substantiate this focus on high power, Experiment 1a tested whether the effects of construal are, indeed, specific to high power or if they also apply to low power. One may define and induce construal among low-power people in at least three different ways—those who, per definition, possess low outcome control (Fiske & Berdahl, 2007) could either (a) construe their own low power as *low* responsibility/opportunity; (b) construe their power-holders' (i.e., *another* person's) power as high responsibility/opportunity; or (c) construe their own low power as implying still *some* responsibility/opportunity (though factually possessing relatively low control). As the fairest test inducing construal and power orthogonally and independently, we implemented option

(c); this allowed us to show that focusing on one's *own* opportunities (vs. responsibilities) promotes challenge for those high, but not those low, in power. To compare high-power-as-responsibility to low power in general, Experiments 1b and 2 included a standard (neutral) low-power condition. Finally, to test which construal may drive the effect, Experiment 3 included standard high-power without reference to opportunity/responsibility.

Ideal sample size was determined prior to data collection to balance statistical power, participant availability, and extensive physiological assessment (g*power; Faul, Erdfelder, Lang, & Buchner, 2007; power .80; α=.05; Experiment 1a: estimated small-medium effect f=.15; ideal *N*=351; Experiment 1b: f=.25, *N*=128; Experiments 2,3: *N*=25 per cell). Due to participant availability and lab capacity, sample size is lower in the studies involving physiological measures. Lab sessions were scheduled for one or two week(s), after which data collection was completed.

Experiment 1a: Manipulating Power and Construal orthogonally

As a first step, we manipulated power and construal orthogonally. This served to test the prediction that construing *high* power as opportunity, rather than responsibility, heightens challenge—which should not be the case for *low* power as opportunity (vs. responsibility). For exploratory purposes, we also assessed the demand-resource relation people experience in the situation at hand. Power-holders (but not the powerless) construing their position as opportunity should perceive that demands can be met with their resources, which should be less so when construing their position as responsibility.

Methods

Participants and Design

Three-hundred and four participants (211 female, 92 male, 1 other; M_{age}=36.33 years, *SD*=11.92; range: 18-73) completed a 10-minute online study with a 2 (power: low vs. high) x 2 (construal: opportunity vs. responsibility) between-participants design via prolific. They

were randomly assigned to conditions (low-power-responsibility: *n*=77, low-power-opportunity: *n*=77, high-power-responsibility: *n*=73, high-power-opportunity, *n*=77). Following our predefined inclusion criteria that are common in online studies, we excluded 41 additional people, because they completed the questionnaire in less than 3 minutes, whereas our pretest indicated a duration of about 10 minutes (i.e., they could not have read all instructions), and/or because they were familiar with materials (e.g., the stock investments or the manipulations and, thus, likely with their purpose). After these exclusions, two additional outliers with studentized residuals greater than |2.65| (i.e., $p<.01$) in the main analysis for relative challenge were excluded (see Neter, Kutner, Nachtschiem, &Wasserman, 1996). The main results are similar but slightly weaker for the whole sample.

Procedure

Participants imagined themselves being in a "business situation", making investments in manager-assistant teams. This setting followed an established procedure to manipulate power and to induce a perception of opportunities and/or responsibilities (Scholl & Sassenberg, 2014). Participants learned that they were working as *assistant* (low power) or *manager* (high power) for a well-known investment firm. The firm was about to reinvest a large amount of money in new capital assets. Reinvesting this money was described as an *opportunity* (e.g. to increase their clients' personal funds and the company's income) or *responsibility* for their firm (e.g., to secure their clients' retirement savings plans and meet the company's corporate responsibility; see Materials for complete instructions).

They read that they would perform two rounds of investment decisions and receive feedback; in fact, these rounds did not take place, but served to create an (anticipated) motivated performance situation that can induce threat / challenge. Following standard power role manipulations, *assistants* learned they would check information and provide suggestions (e.g., which stocks to invest in); *managers* would make final decisions and evaluate the

assistant's performance (Scholl & Sassenberg, 2014; see also, e.g., Guinote, 2007). To make this upcoming task as vivid and real as possible, participants received general information about stock investments (e.g., brief definitions of 'market capitalization', 'dividend yield', etc.) and performed an individual 'practice trial', for which they chose three (out of six available) stocks to invest in.

Then, supposedly before starting the actual investment task together, participants indicated the level of challenge/threat as well as the demands/resources they perceived at this very moment; they completed a power manipulation check and control measures, were debriefed that the joint investments would not actually take place, thanked, and compensated.

Measures

Unless indicated otherwise, responses were given on seven-point scales (1-*strongly disagree / not at all;* 7-*strongly agree / very*). Twelve items (six each) assessed challenge and threat towards the upcoming investment task and participants' role (e.g., "I feel a little threatened"; "I am very much up for getting started"). These were adapted from the Stress Appraisal Measure (Peacock & Wong, 1990; Roesch & Rowley, 2005). In an exploratory principle component factor analysis, threat and challenge items loaded (with opposite signs) on one single factor, explaining 46.4% of the variance. Accordingly, after recoding threat items, all items were averaged in a *relative challenge* index (α=.89).

Two items each assessed the *demands* and *resources* perceived when entering the situation participants wrote about (e.g., "How demanding do you expect the task to be?"; "To what extent do you expect to have all the resources you need for this task?"; Mendes, Blascovich, Major, & Seery, 2001), $r(304)=.71$ and .47, $ps<.001$. We assessed these after our main outcomes in order not to potentially interrupt effects on challenge. As indicator of the perceived *demand-resource-relation*, we calculated the difference of resources and demands, similar to the threat-challenge index (i.e., subtracting demands from resources). As *power*

manipulation check, participants indicated how subjectively powerful they feel at this moment in their role (eight items on nine-point scales; "To what extent do you feel…", e.g., "passive–active", α=.91; Smith et al., 2008).

Results

Power Manipulation Check.

High-power participants felt more powerful (*M*=5.96, *SD*=1.50) than low-power participants (*M*=5.44, *SD*=1.44), *F*(1, 300)=9.06, *p*=.003, $\eta^2_{part.}$=.029. There was neither a main effect of Construal, *F* < 1, nor a Power x Construal interaction, *F*(1, 300)=2.07 *p*=.151, $\eta^2_{part.}$=.007. This suggests that our power manipulation was successful and that construal unlikely altered feelings of power.

Main Analyses

Relative challenge. We expected construal as responsibility to induce less challenge than construal as opportunity among those high, but not those low in power. A 2 (Power) x 2 (Construal) analysis of variance tested this. This analysis yielded no main effect of Power or Construal, *F*s<1, *p*s>.818, but the predicted Power x Construal interaction, *F*(1, 300)=7.67, *p*=.006, $\eta^2_{part.}$=.025, *MD*=.652, 95%CI=[.189; 1.115], indicating a significant reversal of the effect of construal for participants in the *low* power, compared to the *high* power, condition.

As predicted, participants in the *high*-power conditions appeared more challenged under a construal as opportunity (*M*=.88, *SD*=2.18) than construal as responsibility (*M*=.28, *SD*=1.87), *F*(1, 300)=3.18, *p*=.075, $\eta^2_{part.}$=.010; the reverse was true for *low* power, here participants felt less challenged under a construal as opportunity (*M*=.26, *SD*=1.90) than construal as responsibility (*M*=.97, *SD*=2.22), *F*(1, 300)=4.56, *p*=.034, $\eta^2_{part.}$=.015, see Figure 1a. Put differently, the construal as *opportunity* seemed to raise more relative challenge among participants with high power than those with low power, *F*(1, 300)=3.48, *p*=.063,

$\eta^2_{part.}$=.011, whereas a construal as *responsibility* raised less challenge among participants with high than those with low power, $F(1, 300)=4.20$, p=.041, $\eta^2_{part.}$=.014.

Moreover, we tested for which conditions participants reported more challenge than threat—in other words, for which conditions our *relative challenge* measure significantly differed from zero. Within our measure, only participants in the high-power-opportunity condition, $t(76)=3.54$, p=.001, but not in the high-power-as-responsibility condition, $t(72)=1.30$, p=.200, reported more challenge than threat. In contrast, only participants in the low-power-responsibility condition, $t(76)=3.84$, p<.001, but not in the low-power-opportunity condition, $t(76)=1.22$, p=.226, reported more challenge than threat.

We also ran additional exploratory analyses. Note that our main dependent measure, relative challenge, composed of items assessing challenge towards (a) the investment *task* and (b) participant's *role*; accordingly, we also ran separate analyses for each of the two challenge subscales (consisting of 6 items each).

For the subscale *relative challenge towards one's role*, there were no main effects, Fs<1, but we did again find the expected Power x Construal interaction, $F(1, 300)=7.28$, p=.007, $\eta^2_{part.}$=.024 ($M_{highpower\text{-}opportunity}$=1.04, SD=2.31; $M_{highpower\text{-}responsibility}$=.52, SD=2.11; p = .148; $M_{lowpower\text{-}opportunity}$=.46, SD=1.92; $M_{lowpower\text{-}responsibility}$=1.30, SD=2.45; p = .018); here, simple comparisons were more pronounced for those low in power.

Results for the subscale *relative challenge towards the task* yielded no main effects, Fs<1, but similar to the previous analyses also showed the predicted Power x Construal interaction, $F(1, 300)=6.64$, p=.010, $\eta^2_{part.}$=.022; simple comparisons here were more pronounced for those high in power ($M_{highpower\text{-}opportunity}$=.72, SD=2.26; $M_{highpower\text{-}responsibility}$=.05, SD=1.83; p = .050; $M_{lowpower\text{-}opportunity}$=.07, SD=2.08; $M_{lowpower\text{-}responsibility}$=.64, SD=2.18; p = .094). Taken together, these findings supported predictions.

Additional analyses: Resources-demands relation

Building upon these findings, we explored if construal as opportunity (versus responsibility) may promote challenge among high-power (but not low-power) participants because the former may perceive a better demands-resources-relation. To do so, we tested for moderated mediation via bootstrapping (Hayes, 2010; Model 7; all predictors centered); Construal served as predictor, the perceived demands-resources-relation as mediator, Power as moderator of the path from predictor to mediator, and relative challenge as outcome.

Results supported this, Index of Moderated Mediation $B = -.71$, $SE = .35$, 95%CI [–1.435; –.108]; Power x Construal predicted the mediator perceived demands-resources-relation, $B = -.87$, $SE = .41$, $p = .034$, 95%CI [–1.681; –.068], and the mediator predicted the outcome relative challenge, $B = .81$, $SE = .05$, $p < .001$, 95%CI [.715; .901; .639]. Importantly, conditional indirect effects indicated that construal as opportunity (vs. responsibility) predicted a better demands-resources-relation and, thereby, more challenge only among those *high* in power, $B = -.60$, $SE = .24$, 95%CI [–1.12; –.173], not among those *low* in power, $B = .11$, $SE = .24$, 95%CI [–.358; .628]. In short, effects were specific to high power.

To conclude, this study yielded first evidence that how people construe a power-role differentially affects how challenged they feel towards a potentially stressful situation (here, the investments): *High* power as opportunity (vs. responsibility) appeared to promote challenge, whereas *low* power as opportunity (vs. responsibility) produced the opposite. Importantly, this shows that it is the construal of *high* power (rather than of any role, such as a low-power role) as opportunity, rather than responsibility, resulting in higher challenge. Our additional analyses suggest that these effects may be driven by the perceived demands-resources-relation. Yet, as these results are correlational and exploratory, they remain tentative.

Experiment 1b: Construal of High Power, low Power, and Appraisals

Building upon Experiment 1a, we implemented even more controlled conditions to rule-out demand effects. To do so, we assessed challenge towards an intelligence test that was unrelated to the power role. As Experiment 1a yielded support that our predictions are specific to high power, we implemented a more parsimonious design: the two main conditions high-power-as-responsibility versus high-power-as-opportunity plus one 'standard' low-power control condition (without reference to opportunities/responsibilities). We predicted that high-power-as-opportunity evokes more challenge than high-power-as-responsibility and 'standard' low-power, with the latter two likely not differing from each other.

Method

Participants and Design

One-hundred and thirty-five undergraduates (96 female; M_{age}=24.86 years, *SD*=5.44; range: 19-61) participated in this experiment, as part of a one-hour study package, in exchange for 8 Euro. Participants were randomly assigned to conditions (standard-low-power: *n*=44, high-power-as-responsibility: *n*=45, high-power-as-opportunity: *n*=46).

Procedure

Participants, up to six at a time, took part in a set of unrelated studies. They received all instructions on screen. First, we induced *power* via standardized power-roles (Guinote, 2007a; Weick & Guinote, 2010) similar as in Experiment 1a. Participants imagined working in manager-assistant dyads. Their partner was supposedly situated in another room and would later be connected via the computer. After completing a 'leadership questionnaire', participants received the manager (*high-power-as-opportunity* and *high-power-as-responsibility*) or assistant role (*standard-low-power*). The manager would instruct and evaluate the assistant; the assistant would contribute solutions.

To reinforce these roles, participants engaged in a role-matching task (Scholl et al., 2017b; Weick & Guinote, 2010). Participants judged another person's ideas in a creativity

contest. High-power participants' judgment would contribute to 50% of the final evaluation determining the winner (i.e., participants *did* influence another person's outcome). Low-power participants' evaluation was 'interesting, but would *not* determine the winner' (i.e., participants did *not* influence the other's outcome). Participants saw photographs of five products (e.g., fitness device, perfume bottle) with a product name attached to each, supposedly generated by the other person. They evaluated the innovativeness of each name.

Second, we induced *construal* in the high-power conditions. Participants learned that they would collaborate with their manager (standard-low-power) or assistant (both high-power conditions) on a new project. High-power-as-*opportunity* [vs. -responsibility] was induced via the manager's role description. Participants learned that, as the manager, they had the *opportunity* [vs. responsibility] to instruct the assistant and distribute tasks, were in charge of the assistant's work, and *were able to evaluate* [vs. will take care of evaluating] the assistant's work. In parallel, low power participants read that as assistant, they would follow the manager's instructions and complete tasks the manager gave to them. The manager would be in charge and evaluate them (see Guinote, 2007a). Participants then completed a *power manipulation check* and learned that their partner was still engaged in another task. They were asked to proceed to an 'unrelated study' while waiting (see Galinsky et al., 2003; Guinote, 2007a).[2]

All participants were then presented with an intelligence test supposedly used in interviews to predict job performance. Participants solved one example item and expected to solve another 20 items within three minutes. This test, in fact, did not take place. It served as standardized motivated performance situation. Participants reported relative challenge regarding this test and were then debriefed.

Measures

Participants responded on 7-point scales (1-*strongly disagree* to 7-*strongly agree*). Two items assessed *perceived power* (e.g., "In the upcoming tasks, I will be in charge"), $r(135)=.89$, $p<.001$. Following Experiment 1a, six items (three items each) assessed challenge and threat regarding the intelligence test (e.g., "I think I can master these tasks"; "I am afraid of not being able to solve the tasks"). Again, these converged on one factor (59.39% of variance explained, $\alpha=.86$) and were collapsed to indicate *relative challenge*.

Results

In this and the following studies, we tested hypotheses with orthogonal contrasts (Abelson & Prentice, 1997) because all studies fulfilled the criterion of a clear hypothesis allowing for an a priori contrast to be tested. This procedure allows for (1) a focused test of the hypothesis (i.e., by means of one *focal contrast*) and (2) a test whether any variance is left to be explained (i.e., by the remaining *residual contrasts*) after removing the variance explained by the focal contrast. This test is more parsimonious, focused, and has greater power (Myers & Well, 1995; Niedenthal, Brauer, Robin, & Innes-Ker, 2002) to detect interaction hypotheses with no classical cross-over pattern, but instead a pattern in which only one condition—in our studies the high-power-as-opportunity condition—is predicted to differ from all the other implemented conditions. With three experimental conditions, we here included *one focal* contrast (comparing high-power-as-opportunity to high-power-as-responsibility and standard low-power) and *one residual* contrast testing potentially unpredicted remaining differences (comparing high-power-as-responsibility to standard low-power).

Power Manipulation Check

Both high-power-as-opportunity ($M=6.26$, $SD=.78$) and high-power-as-responsibility participants ($M=6.02$, $SD=.92$) perceived more power than low-power participants ($M=2.44$, $SD=.86$), focal contrast (1 1 -2): $F(1,132)=552.29$, $p<.001$, $\eta^2_{part.}=.807$. The high-power

conditions did not differ, residual contrast (1 -1 0): $F(1,132)=1.76$, $p=.186$, $\eta^2_{part.}=.013$. Accordingly, the power manipulation was successful.[3]

Relative Challenge

We expected high-power-as-opportunity to elicit more challenge than both high-power-as-responsibility and standard low-power, captured by the focal contrast (2 -1 -1). We predicted no differences between high-power-as-responsibility and low-power, tested with the residual contrast (0 1 -1). Indeed, results indicated that high-power-as-opportunity induced more challenge ($M=2.79$, $SD=2.02$) than both high-power-as-responsibility ($M=1.33$, $SD=2.27$) and low-power ($M=1.43$, $SD=2.25$), focal contrast: $F(1,132)=12.70$, $p=.001$, $\eta^2_{part.}=.088$, $MD=1.411$, 95% CI=[0.628; 2.195]. High-power-as-responsibility elicited a similarly (low) level of challenge as low-power, residual contrast: $F<1$, $p=.819$ (Figure 1b).

Discussion of Experiments 1a and 1b

Experiments 1a and 1b yielded consistent evidence that high (compared to low) power can heighten challenge—but only when power-holders construe power as opportunity (not responsibility). Participants in both high-power conditions *did* perceive high power. However, power-holders construing power as responsibility reported lower challenge than those construing power as opportunity. In fact, power-holders construing power as responsibility showed a response similar to those having ('standard') low power (Experiment 1b). Experiment 1a further showed that these effects are specific to construal of high (rather than low) power. Taken together, this demonstrates that simply construing high power differently can alter how challenging a (potentially straining) situation appears.

As strengths, these studies relied on highly controlled power roles, supporting the internal validity of findings. Experiment 1a yielded initial evidence that perceptions of resources as sufficing to meet demands may drive the effects. Yet, as our results here were correlational and exploratory, this calls for a more direct test. Future research could aim at

compensating effects of high-power-as-responsibility, for instance, by independently inducing high resources / low demands—in which case the effects of construal as responsibility (vs. opportunity) on challenge should disappear.

As a potential limitation, both studies assessed threat-challenge appraisals as valid, but subjective indicators. Extending this to objective indicators, with potential implications for health, Experiments 2 and 3 assessed physiological responses (Blascovich, 2008; Seery et al., 2010) to more realistic power roles. Again, we implemented the two crucial conditions high-power-as-responsibility vs. high-power-as-opportunity. Each study included an additional 'standard' low- or high-power condition, respectively. This served as a more practical approach for these studies with extensive physiological testing and enabled us to directly relate our results to earlier findings how 'standard' low- vs. high-power affects physiological responses (Akinola & Mendes, 2014; Scheepers et al., 2012).

Experiment 2: Construal of High Power and Cardiovascular Responses

We here relied on real-life power experiences to promote external validity. To assess physiological indicators of threat and challenge, participants 'relived' a past experience by delivering a speech to a web cam (Scheepers et al., 2012). We hypothesized that high-power-as-opportunity will evoke a stronger physiological pattern indicative of challenge than high-power-as-responsibility and standard low-power.

Method

Participants and Design

Eighty-one undergraduates (70 female; M_{age}=19.48 years, *SD*=2.09; range: 17–28) participated in exchange for course credit or 4€. Participants were randomly assigned to conditions (standard-low-power: *n*=30, high-power-as-responsibility: *n*=26, high-power-as-opportunity: *n*=25).[4]

Procedure

Participants, up to two at a time in separate cubicles, took part in a 30-minute-experiment with continuous physiological measurements. They received all instructions and measures on screen. First, the experimenter attached sensors for cardiovascular recording. Second, we recorded *baseline* cardiovascular measures for five minutes, during which participants sat quietly and watched a neutral movie.

Third, we induced *power* and *construal* of high power; participants recalled and relived a personal experience related to power (Galinsky et al., 2003). *Low*-power participants recalled an incident in which someone had power over them (i.e., control over something they wanted; with no reference to responsibility or opportunity). *High*-power participants recalled an incident in which they had power (i.e., controlled the ability of another person/persons to get something they wanted, or were in a position to evaluate them; see Galinsky et al., 2003). All participants received the identical (low vs. high) power definition. To induce construal in the high-power conditions, high-power-as-responsibility [vs. *–opportunity*] participants were asked to recall a situation in which that power had meant being responsible for making decisions and pursuing important goals [vs. *had implied an opportunity to* do so].

Fourth, participants prepared a speech about how they had felt, what had happened, and how they had handled this situation (Scheepers et al., 2012). To give participants sufficient time to recall their experience, this speech preparation period could take at least one minute up to three minutes (M=101.93 seconds, SD=38.32). Afterwards, participants delivered this speech to the web camera, also lasting one up to three minute(s). During the speech, we recorded (changes in) cardiovascular measures. Finally, participants completed checks and control measures.

Measures

Our primary measures comprised *cardiovascular reactivity* during the speech, compared to baseline. Physiological measures were recorded noninvasively (Sherwood et al.,

1990). A Biopac MP150 system (Biopac Systems In., Goleta, CA) continuously recorded impedance-cardiographic (ICG) and electro-cardiographic (ECG) signals. A Nexfin® BMEYE monitor, a continuous beat-to-beat blood pressure monitor making use of a finger cuff and the volume clamp method, measured blood pressure on the non-dominant hand. This monitor has been validated against readings obtained with auscultatory measurements (Riva-Rocci/Korotkoff; Eeftinck Schattenkerk et al., 2009). Data was stored and scored using Acqknowledge 4.3.1 software.

Cardiovascular indicators. In line with common practice, cardiac output (CO), total peripheral resistance (TPR), and a threat-challenge index (TCI), combining CO and TPR in one single, reliable indicator (Blascovich et al., 2004; Mendes et al., 2007; Scheepers et al., 2012) served as indicators of *threat* and *challenge*. Heart rate (HR) and pre-ejection period (PEP) served as indicators of *task engagement* qualifying the speech as motivated performance.

Checks regarding speeches. Recording speeches enabled us to run checks about the recalled situations. One rater blind to condition coded speech behavior and context features of the recalled situation. The rater rated (1) power context (e.g., family, education), (2) *coded power* (how much power participants possessed in the situation), (3) evidence of experimental condition (which condition the rater suspected participants to be in), and (4) *coded responsibility / opportunity* (how much participants expressed responsibilities / opportunities, respectively; 1-*very low* to 7-*very high*). A second rater coded ten percent of the speeches to validate the first rater's coding (inter-rater agreement: $.61<r(9)<.82$, $\chi^2(9)=21.00$, $p=.013$).

Manipulation checks. Responses were given using 7-point scales (1-*not at all* to 7-*compelety*). Two items assessed *perceived power* (e.g., "I was in charge in this situation"), $r(81)=.80$, $p<.001$. Four items each measured *perceived responsibility* (e.g., "I was

responsible for achieving important goals", α=.81) and *perceived opportunity* (e.g., "I had opportunities to achieve important goals", α=.71).[5]

Perceived (subjective) power and externally coded (objective) power theoretically represent the same construct and were highly correlated, $r(80)=.91$, $p<.001$. Hence, these were *z*-standardized and collapsed into one score. The same applies to perceived and coded responsibility / opportunity, respectively, $r_{responsibility}(80)=.62$, $r_{opportunity=}.40$, $ps<.001$. Accordingly, both opportunity-indicators and both responsibility-indicators (all *z*-standardized) were combined into an opportunity check and a responsibility check.

Results

Checks Regarding Speeches

Recalled situations ranged from Family (32%), Education (25%), Sports (23%), to Work (20%) and were unaffected by condition, $\chi^2(6)=7.54$, $p=.274$. As a first substantiation of the success of our manipulations, the rater correctly categorized 86% of the speeches to the three experimental conditions, $\chi^2(4)=104.44$, $p<.001$.

Power Check

High-power-as-opportunity ($M=.73$, $SE=.05$) and high-power-as-responsibility participants ($M=.72$, $SE=.05$) expressed more power than low-power participants ($M=-1.22$, $SE=.05$), focal contrast (1 1 -2): $F(1,77)=1173.34$, $p<.001$, $\eta^2_{part.}=.938$. Expressed power did not differ between high-power conditions, residual contrast (1 -1 0): $F<1$, $p=.842$. Separate analyses for these two measures yielded the same findings. Hence, as intended, expressed power differed for low vs. high power, but was *equal* in the two high-power conditions.[6]

Construal Check

High-power-as-responsibility participants expressed more *responsibility* ($M=.82$, $SE=.11$) than high-power-as-opportunity participants ($M=.21$, $SE=.11$) and low-power

participants (*M*=–.89, *SE*=.10), focal contrast (1 1-2): $F(1,77)=129.56$, $p<.001$, $\eta^2_{part.}=.627$, residual contrast (-1 1 0): $F(1,77)=16.33$, $p<.001$, $\eta^2_{part.}=.175$.

Expressed *opportunity* was highest for high-power-as-opportunity (*M*=.79, *SE*=.12), followed by high-power-as-responsibility (*M*=.09, *SE*=.11), and lowest for low-power participants (*M*=–.71, *SE*=.11), focal contrast (1 1-2): $F(1,77)=75.13$, $p<.001$, $\eta^2_{part.}=.494$ and residual contrast (1 -1 0): $F(1,77)=18.40$, $p<.001$, $\eta^2_{part.}=.193$. Separate analyses for self-ratings and external coding yielded similar patterns. Accordingly, participants followed instructions and manipulations were both subjectively and objectively successful.

Cardiovascular Reactivity Checks

Following standard practice, we calculated mean scores for HR, PEP, CO, and TPR for the last minute of the baseline and the first minute of the speech (Scheepers et al., 2012; Seery, Weisbuch, Hetenyi, & Blascovich, 2010; descriptive statistics in Supplemental Material). Reactivity scores were calculated by subtracting baseline scores from speech scores. Data was checked for outliers below or above 3.3 *SD*s the mean. Three outliers were identified. Thorough data checks ruled out that these are due to measurement errors. Hence, we followed the standard procedure and replaced outliers with the next higher (non-outlying) value of the sample (Scheepers et al., 2012; Weisbuch-Remington, Mendes, Seery, & Blascovich, 2005). Note that our main results including the original values remain the same or become even stronger (for TCI, outliers work in favor of the hypothesis). As more conservative test, we used the procedure described here.

For the *threat-challenge index* (TCI), we subtracted z-scored TPR reactivity from z-scored CO reactivity (Seery et al., 2010; Scheepers et al., 2012). This index represents relative threat-challenge in a single, more reliable index (Seery et al., 2010). Higher values signal more efficient blood transportation, a motivational state indicative of *relative challenge*.

Task engagement. A prerequisite for threat and challenge is that the task is engaging (Blascovich, 2008). This implies an increase in HR and a decrease in PEP from baseline to speech (i.e., reactivity scores being different from zero). Indeed, HR reactivity increased from baseline to speech, $t(80)=14.81$, $p<.001$, $MD=18.49$, 95% CI [16.00; 20.97], while PEP reactivity decreased, $t(80)=-11.08$, $p<.001$, $MD=-15.24$, 95% CI [-17.98; -12.51].

We also tested the general tendency towards challenge or threat. Across conditions, there was a general tendency towards challenge—as indicated by an overall increase in CO, $t(80)=3.54$, $p=.001$, $MD=.89$, 95% CI[.39; 1.39] and decrease in TPR, $t(80)=-3.19$, $p=.002$, $MD=-371.54$, 95% CI [-603.02; -140.06] (see Tables in Supplemental Material).

Together, this indicates that our speech task constituted motivated performance and created an overall *challenge* tendency. In other words, all participants were well able to deliver the speech, even though it concerned a personal memory that was, by the time itself, likely demanding. This overall tendency may have been due to the way our speech task was designed. By providing some flexibility in speech preparation time, participants may already have come to regulate some threat away (e.g., they might not have started unless they felt relatively 'good' about the situation they were about to explain). Descriptively, preparation time was related to more relative challenge (a higher TCI; $r(81)=.16$, $p=.155$). To control for this, we controlled for speech preparation time, unaffected by condition, $F(2,78)=1.43$, $p=.246$, in our main analyses. Note that, despite this overall challenge pattern, it is still possible to test our hypothesis—that high-power-as-responsibility and low-power result in *relatively* less challenge than high-power-as-opportunity.

Cardiovascular Threat and Challenge

We predicted that compared to high-power-as-opportunity, high-power-as-responsibility (and low-power) would evoke less challenge. That is, the latter two conditions would result in relatively lower CO reactivity, higher TPR reactivity, and lower relative

challenge (TCI). As before, we tested this with orthogonal contrasts (Abelson & Prentice, 1997) controlling for speech preparation time. For this purpose, we included the focal contrast (2 -1 -1) and the residual contrast (0 1 -1).

Supporting our hypothesis, *CO reactivity* was higher for high-power-as-opportunity (M=1.16, SE=.21) and high-power-as-responsibility (M=.55, SE=.20) than for low power (M=.51, SE=.19), focal contrast: $F(1,77)=6.51$, $p=.013$, $\eta^2_{part.}=.078$, MD=0.630, 95% CI=[0.138; 1.122]. High-power-as-responsibility and low-power did not differ, residual contrast: $F<1$, $p=.904$ (Figure 2a).[7] Analyses yielded no differences between conditions for *TPR reactivity* ($M_{opportunity}$=–499.50, SE=165.19; $M_{responsibility}$= –407.28, SE=160.76; $M_{low\ power}$=–366.71, SE=151.08), focal contrast: $F<1$, $p=.574$, residual contrast: $F<1$, $p=.855$.

As expected, high-power-as-opportunity (M= .51, SE=.32) tended to evoke more *relative challenge* than high-power-as-responsibility (M=–.18, SE=.31) and low power (M=–.27, SE=.29), focal contrast: $F(1,77)=3.65$, $p=.060$, $\eta^2_{part.}=.045$, MD=0.737, 95% CI=[-0.032; 1.505]. High-power-as-responsibility and low power did not differ; residual contrast: $F<1$, $p=.849$ (Figure 2b). Accordingly, results supported our hypothesis for CO and (marginally) for TCI.

Discussion

Experiment 2 was the first to examine how high-power-as-opportunity, compared to high-power-as-responsibility and low power, predicts *physiological* threat-challenge indicators. High power did promote greater challenge when it is construed as opportunity, rather than as responsibility (and compared to low power). The findings corroborate and extend our previous studies by showing changes in cardiac performance, here regarding threat-challenge responses to real experiences from various power contexts.

Notably, however, our results need to be treated with some caution. First, participants overall seemed challenged (not threatened). Despite the advantages of recalling real-life

experiences, this may have been caused by the way our speech task was designed, as suggested by results being stronger when controlling for preparation time. To ensure the robustness of findings, we sought to replicate this in a follow-up study with a more standardized induction of construal before giving a speech about an identical situation.

Second, we compared construal of high power either to standard low power (Experiments 1b and 2) or to construal of low power (Experiment 1a). To extend this, Experiment 3 examined which construal among power-holders may drive the effect by including a neutral high power condition.

Experiment 3: Construal, Standard High Power, and Cardiovascular Responses

This study compared high-power-as-opportunity and high-power-as-responsibility to *standard high-power*—the latter inducing no specific construal of power. This allowed us to examine whether opportunity represents the likely 'default' construal, while additional demands may come into play when high power is construed as responsibility. The experiment implemented a role-playing exercise with a confederate to create a vivid, but controlled context in which all participants delivered a speech about an identical task. We predicted that high-power-as-opportunity would elicit more challenge than high-power-as-responsibility—and, potentially, similar to standard high-power.

Method

Participants and Design

Fifty-four undergraduates (45 female; M_{age}=20.91 years, *SD*=2.40; range: 18-27) participated in exchange for course credit or 10 Euro. Participants were randomly assigned to conditions (responsibility: *n*=19; opportunity: *n*=22; standard: *n*=13).[8]

Procedure

Two people at a time completed a study on "team decision-making". In fact, one person was the actual participant, the other a confederate. The role-play served to induce high

power and manipulate construal. Upon arrival, each participant was introduced to the confederate and seated in a private cubicle in front of a computer equipped with a web camera.

Following Experiment 2, we measured cardiovascular responses with the same indicators between baseline (last 3 minutes) and speech. After baseline measurements, all participants received high-power in a decision-making task. Participants learned that they would form a team with 'the other participant'. Their team would solve a number of tasks, with the best performing team earning a 25 Euro bonus. One member would be the 'captain', the other the 'advisor'. Participants completed an individual estimation task (estimating the correct number of marbles in two vases), supposedly to assign them to their role. In fact, all participants were the 'captain' (high-power role). The confederate always was the 'advisor' (low-power role).

The captain's role description induced construal. High-power-as-*opportunity* [vs. -responsibility] participants read that, as team captain, they had the *opportunity* [vs. responsibility] to determine the final team decision and were *able to determine how the bonus is distributed* [vs. responsible for distributing the bonus]. In parallel, participants in the standard-high-power condition read that as team captain, they determine the final answer for the team and distribute the possible bonus. This followed the standard procedure to induce 'default' high power (Galinsky et al., 2003; Guinote, 2007a, 2007b) without reference to opportunities/responsibilities.

We then created a motivated performance situation. First, participants solved three estimation tasks individually (e.g., estimating the costs of an all-inclusive holiday) within a maximum of three minutes per estimation. Second, they delivered a speech in the webcam about their estimations (lasting at least one up to three minutes). The speech was recorded and presented to the 'advisor', who would respond to their estimations. Participants then

completed an advice-taking task unrelated to the current research (these results are reported in De Wit et al., 2017), as well as checks and control questions.

Measures

Reactivity scores from baseline to speech for HR, PEP, CO, and TPR were, again, our primary indicators. We also assessed *perceived power* with two items (Anderson & Galinsky, 2006; 1-*strongly disagree* to 7-*strongly agree*), $r(54)=.45$, $p=.001$.

Results

Power Check

Perceived power was higher than the midpoint (i.e., 4) of the scale ($M=5.13$, $SE=.16$), $t(53)=7.19$, $p<.001$. Accordingly, all participants experienced high power and reported the same level of power across conditions ($M_{opportunity}=5.36$, $SE=.25$; $M_{responsibility}=5.03$, $SE=.27$; $M_{standard}=4.89$, $SE=.32$), focal contrast (1 -2 1): $p=.771$ and residual contrast (-1 0 1): $p=.243$, $Fs<1.40$.[9]

Cardiovascular Reactivity Checks

Following Experiment 2, we calculated mean scores for HR, PEP, CO, and TPR for baseline and speech, then reactivity scores (subtracting baseline from speech scores), the threat-challenge index (TCI) indicating *relative challeng*e), and checked data for outliers (none were identified).

Task Engagement. We first checked whether the speech task was actively engaging. Indeed, HR reactivity increased from baseline to speech, $t(53)=6.36$, $p<.001$, $MD=7.15$, 95% CI [4.89; 9.40], whereas PEP reactivity decreased, $t(53)=-2.43$, $p=.019$, $MD=-3.56$, 95% CI [-6.50; -.62]. Accordingly, the speech constituted motivated performance for which relative challenge could be assessed.

Across conditions, there was a slight (significant) increase in CO, $t(53)=2.80$, $p=.007$, $MD=.06$, 95% CI [.02; .10], and a strong increase in TPR, $t(53)=5.21$, $p<.001$, $MD=516.17$,

95% CI [317.35; 714.98] (see Supplemental Material). Thus, the current context elicited overall threat (rather than challenge) as basic response.

Cardiovascular Threat and Challenge

We predicted that high-power-as-opportunity would elicit relatively more challenge—as indicated by higher CO reactivity, higher TCI, and lower TPR reactivity—than high-power-as-responsibility and potentially similar to standard high-power. Again, orthogonal contrasts tested these specific predictions, with the focal contrast (1 -2 1) and residual contrast (-1 0 1), comparing opportunity vs. responsibility vs. standard. Speech preparation time was not logged; thus, it could not serve as covariate.

As expected, *CO reactivity* tended to be higher for high-power-as-opportunity (*M*=0.11, *SE*=.03) than high-power-as-responsibility (*M*=0.004, *SE*=.03), as did standard high-power (*M*=0.06, *SE*=.04), focal contrast: $F(1,51)=3.18$, $p=.081$, $\eta^2_{part.}= .059$; *MD*=0.077, 95% CI=[0.010; 0.163]. High-power-as-opportunity and standard high-power did not differ, residual contrast: $F<1$, $p=.342$ (Figure 3a).

In addition, *TPR reactivity* tended to be lower in the opportunity (*M*=362.85, *SE*=152.48) than in the responsibility condition (*M*=779.24, *SE*=164.07), as did standard high-power (*M*=391.15, *SE*=198.36), focal contrast: $F(1,51)=3.80$, $p=.057$, $\eta^2_{part.}=.069$, *MD*=402.24, 95% CI=[-11.970; 816.444]. High-power-as-opportunity and standard-high power did not differ, residual contrast: $F<1$, $p=.910$.

Results for *relative challenge* (TCI) demonstrated that high-power-as-opportunity (*M*= 0.52, *SE*=.37) evoked more challenge than high-power-as-responsibility (*M*= –0.71, *SE*=.40), as did standard high-power (*M*= 0.16, *SD*=.49), focal contrast: $F(1,51)=4.33$, $p=.043$, $\eta^2_{part.}=$ .078, *MD*=1.054, 95% CI=[0.037; 2.070]. Again, challenge was similar in the opportunity and the standard condition, $F<1$, $p=.554$ (Figure 3b).

Discussion

Supporting our predictions with physiological indicators, power-holders exhibited relatively less challenge (and more threat) when construing power as responsibility, rather than as an opportunity or simply having 'standard' high power (without construing power in a specific way). This extends results from Experiment 2 by means of highly standardized roles in a realistic role-play and an identical task across conditions which tended to, generally, induce threat (rather than challenge as in Experiment 2). Including "standard" high power suggests that construal as responsibility may have driven the effect; yet, due to our small sample in the control condition, this remains tentative.

Meta-Analysis across Appraisals and Physiological Indicators

Experiments 2 and 3 used smaller samples than ideal to ensure high statistical power. To assess the robustness of findings, we thus conducted a meta-analysis on the effect of *high-power-as-responsibility* versus *high-power-as-opportunity* across studies—as these represent the two crucial conditions we had implemented in all studies and, thus, could combine. To this end, we calculated the mean effect size *r*, weighed for sample size, for (1) the effects on *relative challenge* combined for Experiments 1a and 1b, and (2) the effects on CO reactivity, TPR reactivity, and TCI combined for Experiments 2 and 3 (Table 1).

Importantly, effects for high-power-as-responsibility versus high-power-as-opportunity were significant with mean effect sizes between $.22 \leq r \leq .27$ across outcomes—except for TPR reactivity, whose marginal effect needs to be interpreted with caution. With this one exception, analyses across studies show that high-power-as-responsibility did elicit less (subjective and physiological) challenge than high-power-as-opportunity.

General Discussion

Coveting a high-power position can benefit the way how people regulate behavior (Guinote, 2007b) and respond to stressful situations (Akinola & Mendes, 2014; Scheepers et al., 2012). Yet, at times, high power may be rather taxing, implying potential health hazards

(e.g., Galinsky et al., 2015; Sapolsky, 2005). Relatively little attention has been directed to drawbacks of power for the functioning of those who possess it, especially with regard to how power-holders understand their power. To address this, the present work investigated if the *construal* of power changes psychological and physiological functioning. We proposed that, in straining situations, high power construed as responsibility (rather than as opportunity) may imply a 'burden'—namely, such a construal may reduce the (typically effective) higher challenge and lower threat response among power-holders (Akinola & Mendes, 2014; Scheepers et al., 2012).

Four studies supported this. When power-holders construed power as responsibility, rather than opportunity, they perceived less challenge (see Supplemental Material for additional results among leaders) and showed cardiovascular responses indicative of less challenge. As methodological strengths, we applied subjective and physiological indicators across assigned roles (Experiments 1a and 1b), real-life experiences (Experiment 2), standardized role-play (Experiment 3), and different motivated performance situations; this underlines the validity of findings. Notably, *absolute* threat and challenge patterns differed between Experiments 2 (overall challenge) and 3 (overall threat). Still, both studies yielded the expected *relative* differences between high-power-as-responsibility vs. -opportunity. This suggests that construal of high power likely alters threat-challenge responses even under different baseline conditions. Our meta-analysis further substantiated our hypothesis.

Importantly, Experiment 1a demonstrated that these effects of construal occur for those high in power (but produced an opposite effect for those low in power). This suggests that it is the construal of *high* power (and not of any other role) as opportunity/responsibility resulting in these effects. Moreover, construal affected responses to the intelligence test (Experiment 1b) as a task completely unrelated to power. Still, depending on which construal was induced, power-holders experienced this test as relatively more or less challenging. First,

this study rules out potential demand effects. Second, this result suggests that, just as the experience of high vs. low power can carry over to other contexts (Smith & Galinsky, 2010), also the mere construal of power—understanding one-and-the-same powerful position as responsibility (vs. opportunity)—can change responses to an unrelated situation. Future research could examine if this may be driven by an increased awareness of demands, carrying over across contexts.

Implications for Research and Practice

The results have implications for power research. High (vs. low) power facilitates challenge (Akinola & Mendes, 2014; Scheepers et al., 2012), though personal and structural factors can limit these benefits (Josephs et al., 2008; Sapolsky, 2005). Our research shows that this more effective pattern among power-holders is, in fact, qualified by how power-holders (are led to) *construe* their power. The advantages of high power are mitigated when understanding this position as responsibility, rather than as opportunity.

In fact, power-holders construing power as responsibility revealed a physiological pattern suggestive of a "burden" of power. Moreover, high-power-as-responsibility produced a (low) challenge response pattern somewhat similar to those low in power in Experiments 1b and 2—even though the perceived *level* of power (i.e., outcome control) between construal conditions did not differ. It may well be that construal alters other stress-buffering effects of power, beyond the cardiovascular patterns investigated here, such as hormonal reactions (Akinola & Mendes, 2014), well-being (Kifer et al., 2013), or performance boosts under pressure (Kang, Galinsky, Kray, Shirako, 2015; Schmid & Schmid-Mast, 2013). This remains an avenue for future studies.

Given these findings, one may wonder which construal drives the effects. Experiment 3 suggests that it could be responsibility—in other words, that opportunity might be the likely 'standard' construal of high power. This conclusion remains tentative, however, due to our

small sample. Supporting this idea, established threat-challenge results for 'standard' high power (Akinola & Mendes, 2014; Scheepers et al., 2012) seem more similar to our high-power-as-opportunity condition. Moreover, opportunity appears to be the likely default construal of power in Western cultures (Torelli & Shavitt, 2010). Yet, even within one culture, people can construe 'standard' high power differently, depending on traits (e.g., Chen et al., 2001; Côté et al., 2011; Gordon & Chen, 2013) or situational factors (Scholl et al., 2017a, 2017b). Taken together, if a person receiving high power will understand this power as opportunity or responsibility will likely depend on the context and this specific person.

From a practical point of view, leaders considering power as an opportunity may act in more selfish ways potentially undermining subordinates' performance (Chen et al., 2001; Sassenberg et al., 2014). Accordingly, power-holders acknowledging responsibility are likely to boost organizational success and subordinates' satisfaction (De Hoogh & Den Hartog, 2008). However, the present data suggest that, beyond these benefits for others, becoming aware of one's responsibility may come at costs for power-holders. This seems to create a tension: the type of leadership that benefits organizations may burden the power-holder. To resolve this, power-holders construing power as responsibility might, in the long-run, get used to their responsibilities and develop more supportive relations with subordinates—both of which may help power-holders cope with demands and, thereby, mitigate drawbacks of responsibility. Offering power-holders support in resolving this tension could be one way towards responsible, sustainable leadership.

To conclude, high power provides an opportunity to "get things done", but also responsibility to take care of things. High power can, in principle, facilitate effective functioning in stressful situations. Yet, these benefits seem specific to construing high power as opportunity, rather than responsibility. Those having power may, thus, need to learn how to deal with responsibilities to ensure their own well-being over time.

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Footnotes

[1] A pretest with a non-overlapping sample (N=98) confirmed that Construal did *not* change subjectively experienced power in a high-power role as implemented in Experiment 3: high-power construal neither altered feelings of power ($M_{opportunity}$=5.53, SD=.72; $M_{responsibility}$=5.50, SD=.98; $M_{standard}$=5.38, SD=.86), F<1, nor perceived power ($M_{opportunity}$=5.98, SD=.83; $M_{responsibility}$=6.16, SD=.87; $M_{standard}$=6.12, SD=.76), F<1; both measures were highly correlated, r(98)=.63, p<.001. Importantly, this shows that our effects on challenge very likely do *not* result from any changes in subjectively experienced power between Construal conditions.

[2] In between manipulations and DVs, other factors were manipulated for other studies; these did not significantly alter our effects. When collecting this data, we originally did not intend to test this prediction; for this reason, Experiments 1a, 2, and 3 directly tested our predictions with similar measures or more objective indicators.

[3] We also assessed *opportunity* (e.g., "As part of my role, I can follow my own ideas"; 5 items; α=.88) and *social responsibility* ("I am concerned how my actions impact others"; 5 items, α=.89) after several filler tasks to explore relative responsibility (i.e., combining responsibility- and recoded opportunity-items); $M_{high\text{-}power\text{-}as\text{-}responsibility}$=.27, SD=1.19; $M_{high\text{-}power\text{-}as\text{-}opportunity}$=–.22, SD=1.08, t(89)=2.06, p=.043, d=.43.

[4] The original sample comprised N=89 (n=29 or 30 per condition); due to technical measurement errors, usable cardiovascular data was only obtained for N=81 reported here.

[5] We also explored resources/demands, self-/other-focus, mood, and closeness to the other person(s).

[6] N=1 is missing because the speech recording was unusable.

[7] Results for CO reactivity were similar without covariate ($M_{low\ power}$=.57, SE=.19; $M_{responsibility}$=.54, SE=.20; $M_{opportunity}$=1.11, SE=.21), focal contrast: p=.029, residual contrast:

p=.909. Also, the pattern for TPR was similar without covariate. Results for TCI are similar but weaker without covariate ($M_{\text{low-power}}$=–.20, *SE*=.29; $M_{\text{high-power-as-responsibility}}$ =–.20, *SE*=.32; $M_{\text{high-power-as-opportunity}}$=.44, *SE*=.32), focal contrast: *p*=.102, residual contrast: *p*=.993.

[8] The original sample comprised *N*=75 (*n*=25 per condition); due to technical measurement errors or procedural problems (failures to deliver a speech), only *N*=54 provided usable cardiovascular data. Advice-taking results from this study are reported in a separate paper, see De Wit et al. (2017).

[9] We explored *responsibility*/*opportunity* ("My position felt like a responsibility / opportunity") with four items to predict relative responsibility (combining responsibility- and recoded opportunity-items); $M_{\text{high-power-as-responsibility}}$=4.68, *SE*=.15; $M_{\text{high-power-as-opportunity}}$=4.23, *SE*=.14; $M_{\text{high-power-standard}}$=4.44, *SE*=.18, focal contrast (-2 1 1): *p*=.074, residual contrast (0 -1 1): *p*=.359.

Tables

Table 1. Meta-analytical results comparing the effects of *high-power-as-opportunity* vs. *high-power as responsibility* across Experiments 1a & 1b and across Experiments 2 & 3

Experiments 1a and 1b			
	r (effect size)	*p*	95% CI
relative challenge (self-rated)	.22 ***	< .001	[.1901; .2422]

Experiments 2 and 3 (no covariates included)			
	r (effect size)	*p*	95% CI
CO reactivity	.27 **	.005	[.0603; .4487]
TPR reactivity	.16 $^{+}$	.059	[–.0459; .3599]
relative challenge (TCI)	.24 **	.009	[.0381; .4308]

Note. *** $p < .001$, ** $p < .01$, $^{+}p < .10$; TCI=threat-challenge index from cardiovascular measures; CO=cardiac output; TPR=total peripheral resistance; 95% CI=confidence interval for effect size *r*

Figures

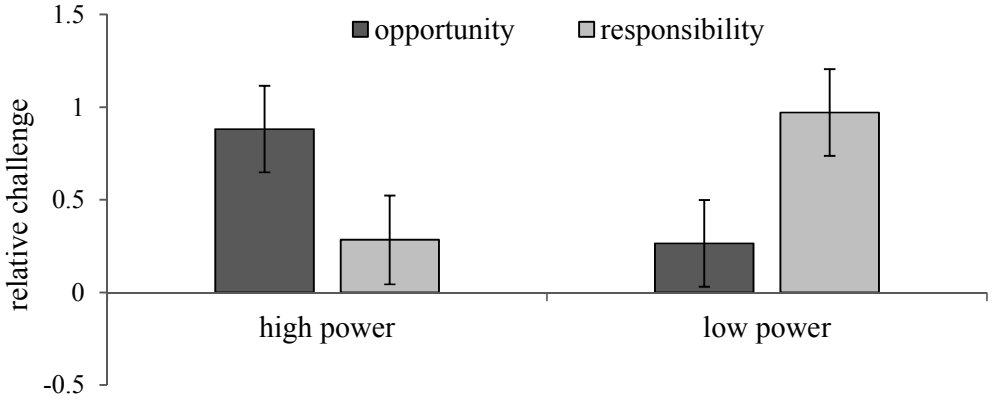


Figure 1a. Relative challenge ratings (higher values indicate relatively more challenge) as a function of Power x Construal (Experiment 1a, $N = 304$).

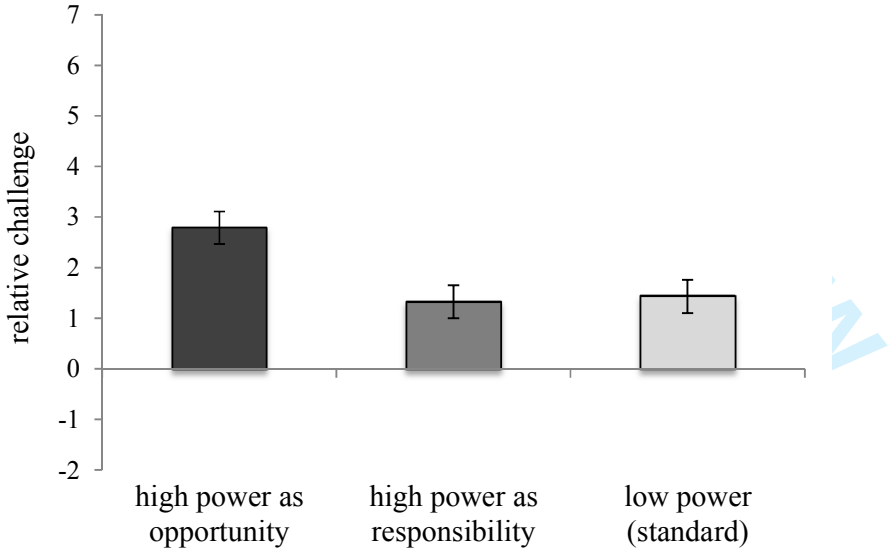


Figure 1b. Relative challenge ratings (higher values indicate relatively more challenge) as a function of Power and Construal of high power (Experiment 1b, $N = 135$).

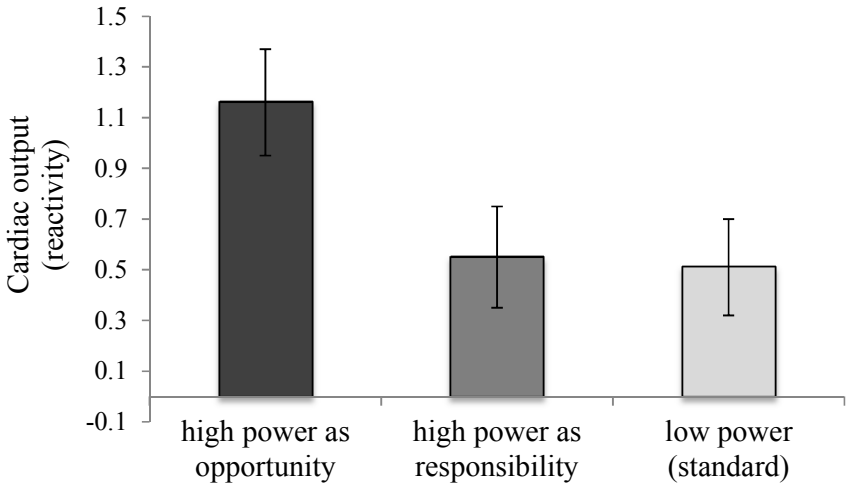


Figure 2a. Cardiac output reactivity (changes for speech over baseline; controlling for speech preparation time) as a function of Power and Construal of high power (Experiment 2, $N = 81$).

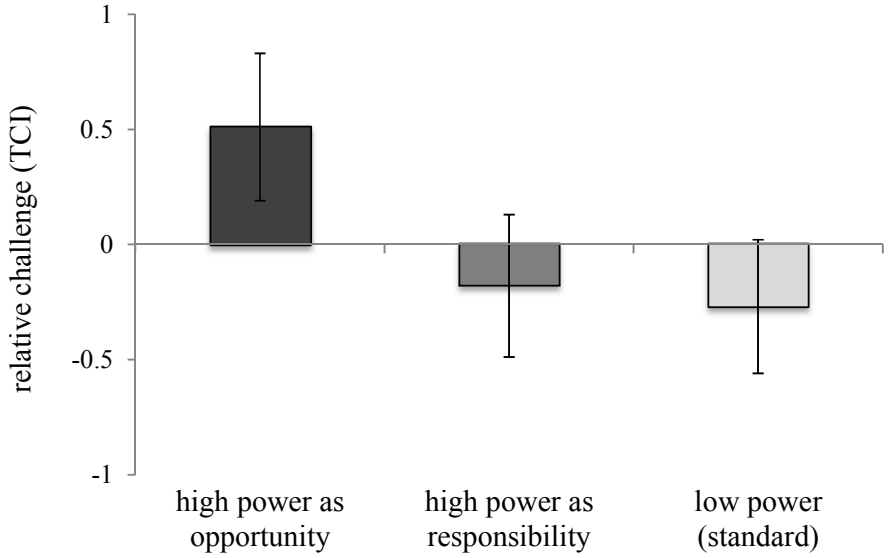


Figure 2b. Relative challenge (TCI=threat-challenge index, higher values indicate relatively more challenge and lower values indicate relatively more threat; controlling for speech preparation time) as a function of Power and Construal of high power (Experiment 2, $N = 81$).

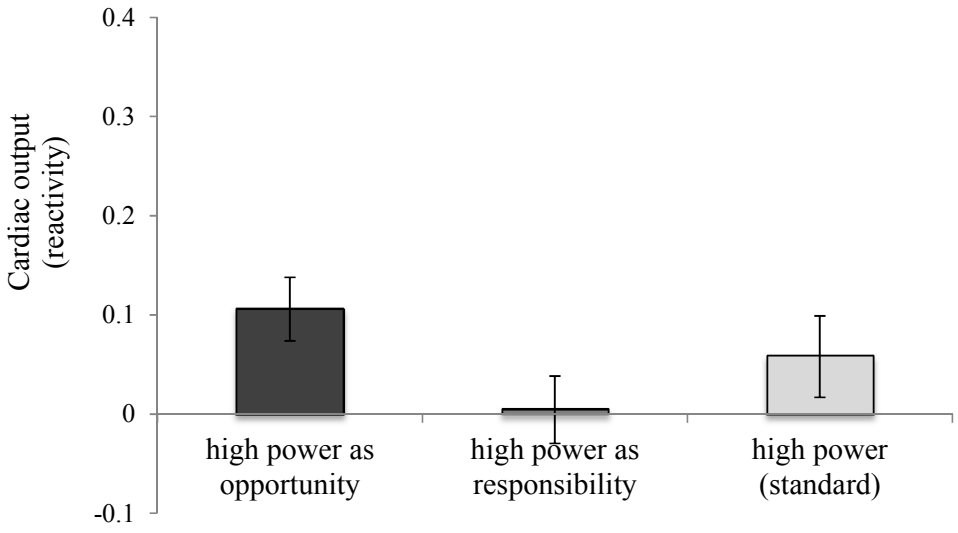


Figure 3a. Cardiac output reactivity (changes for speech over baseline) as a function of Construal of high power (Experiment 2, $N = 54$).

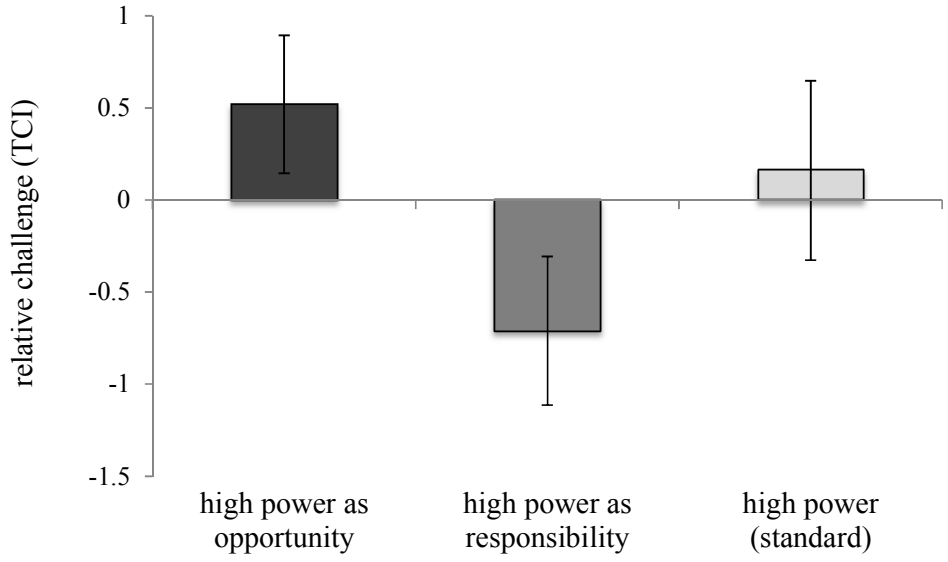


Figure 3b. Relative challenge (TCI=threat-challenge index; higher values indicate relatively more challenge, lower values indicate relatively more threat) as a function of Construal of high power (Experiment 2, $N = 54$).

Instructions and main measures:

The Burden of Power: Construing Power as Responsibility (rather than as Opportunity) Alters Threat-Challenge Responses

Preliminary Experiment

(see Supplemental Material, for results)

original materials were in English

Measures to make power salient

Study on "Workplace perception"

In the following, we are interested in how you perceive your job. Therefore, we ask you to complete a few questions with regard to your current position.

- Do you have a leadership position? No / Yes
- If you have a leadership position, please indicate your current job function: Lower Management / Middle Management /Upper Management
- How many subordinates do you supervise?

Please answer the following questions with regard to your current position at work.

- To what degree do you have financial scope over salary or bonus allocation for staff?
- To what degree do you have authority over the hiring and firing of staff?
- To what extent do you have power in your organization? To what extent do you have power in your department?
- To what degree do you have influence over decisions that affect others in the organization?

(1 = not at all, 7 = a great deal)

Instructions to induce construal of power

(adapted from Galinsky et al., 2003)

In the following, we are interested in experiences which individuals have made at work as part of their leadership / supervisor role. For this purpose, now, we ask you to please recall a specific situation at work and answer some questions about this experience. Please continue to begin with the study.

[High power as opportunity condition:] Please recall a particular incident from you work in which you had power over another individual or individuals. By power, we mean a situation in which you had the opportunity to control the ability of another person or persons to get something they wanted, or were in a position in which you could evaluate those individuals. Please describe this situation in which you had power:
Please specify any opportunities your power gave you, for example, the ability to make certain decisions, the possibility to accomplish certain tasks, or the opportunity to achieve particular goals. What happened in this situation? How did you feel? Which opportunities did you experience?

[High power as responsibility condition:] Please recall a particular incident in which you had power over another individual or individuals. By power, we mean a situation in which you had the responsibility to control the ability of another person or persons to get something they wanted, or were in a position in which you were responsible for evaluating those individuals. Please describe this situation in which you had power:
Please specify any responsibilities your power came with, for example, the duty you experienced to make certain decisions, feeling the requirement to accomplish certain tasks, or the inner obligation to achieve particular goals. What happened in this situation? How did you feel? Which responsibilities did you experience?

Instructions and main measures for Experiment 1a

(original materials were in English)

Power and construal manipulations:

In the following, please imagine yourself being in a business context. Here, you will adopt a specific role and complete a set of business decisions. These decisions provide the chance to make some investments for clients and to seize opportunities to bring your company forward (opportunity condition) // These decisions provide the responsibility to make some investments for clients and the need to take care of your company's success (responsibility condition).

(1) Role assignment & task description:

Low power - opportunity condition:

You are working as an assistant at a well-known investment firm.

Your firm manages the wealth and investments for many individual clients.

One of the firm's equity funds will be dissolved soon. As a result, your firm has rather unexpectedly come across a large amount of money that is available and can be reinvested in new capital assets.

Reinvesting this money provides a huge opportunity for your firm.

There are many options to choose from and ideas to play around with.

If you reinvest the money in a successful manner, this would not only increase your clients' personal funds substantially; it would also be beneficial for your company's income and, finally, for your personal bonus.

The manager of your firm makes final decisions which new projects to invest this money in. **As an assistant, you gather information and provide suggestions to your manager which projects to potentially invest in.** The manager checks your and the other assistants' information, makes final decisions, and evaluates your performance in the end. Accordingly, the manager is in charge of decisions as well as his own and your outcomes.

Low power – responsibility condition:

You are working as an assistant at a well-known investment firm.

Your firm manages the retirement savings funds for many individual clients.

One of the firm's equity funds will be dissolved soon. As a result, your firm has rather unexpectedly come across a large amount of money that is available and can be reinvested in new capital assets.

Reinvesting this money provides a huge responsibility for your firm.

There are many options to check and things to consider.

If you reinvest the money in a successful manner, this would not only secure your clients' retirement savings plans; it would also meet your company's corporate responsibility and, finally, mean following your social conscience.

The manager of your firm makes final decisions which new projects to invest this money in. **As an assistant, you gather information and provide suggestions to your manager which projects to potentially invest in.** The manager checks your and the other assistants' information, makes final decisions, and evaluates your performance in the end. Accordingly, the manager is in charge of decisions as well as his own and your outcomes.

<u>High power – opportunity condition:</u>

You are working as a manager at a well-known investment firm.

Your firm manages the wealth and investments for many individual clients.

One of the firm's equity funds will be dissolved soon. As a result, your firm has rather unexpectedly come across a large amount of money that is available and can be reinvested in new capital assets.

Reinvesting this money provides a huge opportunity for your firm.

There are many options to choose from and ideas to play around with.

If you reinvest the money in a successful manner, this would not only increase your clients' personal funds substantially; it would also be beneficial for your company's income and, finally, for your personal bonus.

As the manager of this firm, you make final decisions which new projects to invest this money in. Your assistants gather information and provide suggestions to you which projects to potentially choose from. As the manager, you check your assistants' information, make final decisions, and evaluate the assistants' performance. Accordingly, you are in charge of decisions as well as your own and your assistants' outcomes.

<u>High power – responsibility condition:</u>

You are working as a manager at a well-known investment firm.

Your firm manages the retirement savings funds for many individual clients.

One of the firm's equity funds will be dissolved soon. As a result, your firm has rather unexpectedly come across a large amount of money that is available and can be reinvested in new capital assets.

Reinvesting this money provides a huge responsibility for your firm.

There are many options to check and things to consider.

If you reinvest the money in a successful manner, this would not only secure your clients' retirement savings plans; it would also meet your company's corporate responsibility and, finally, mean following your social conscience.

As the manager of this firm, you make final decisions which new projects to invest this money in. Your assistants gather information and provide suggestions to you which projects to potentially choose from. As the manager, you check your assistants' information, make final decisions, and evaluate the assistants' performance. Accordingly, you are in charge of decisions as well as your own and your assistants' outcomes.

(2) "Practice trial" to get acquainted with the task:

Low power – opportunity // responsibility conditions:

In the following, you will perform two rounds of investment decisions.

For each round, you and your manager choose between 6 optional projects your firm could invest the money in to *make use of this huge opportunity // meet this huge responsibility*.

For each project, you will see information on the

- g*eneral development* of a company,
- *market capitalization* (aggregate value of a company),
- *P/E ratio* (price relative to earnings per share),
- *dividend yield* (divident relative to price per share),
- *volatility* (variation of trading price over time), and
- *volume* (amount of securities traded).

You as assistant will check these projects and provide a recommendation of the 3 most promising projects to your manager. Your manager checks your recommendation, accepts or rejects it, and makes the final decision.

High power – opportunity // responsibility conditions:

In the following, you will perform two rounds of investment decisions.

For each round, you and your assistants choose between 6 optional projects your firm could invest the money in to *make use of this huge opportunity // meet this huge responsibility*.

For each project, you will see information on the

- *general development* of a company,
- *market capitalization* (aggregate value of a company),
- *P/E ratio* (price relative to earnings per share),
- *dividend yield* (divident relative to price per share),
- *volatility* (variation of trading price over time), and
- *volume* (amount of securities traded).

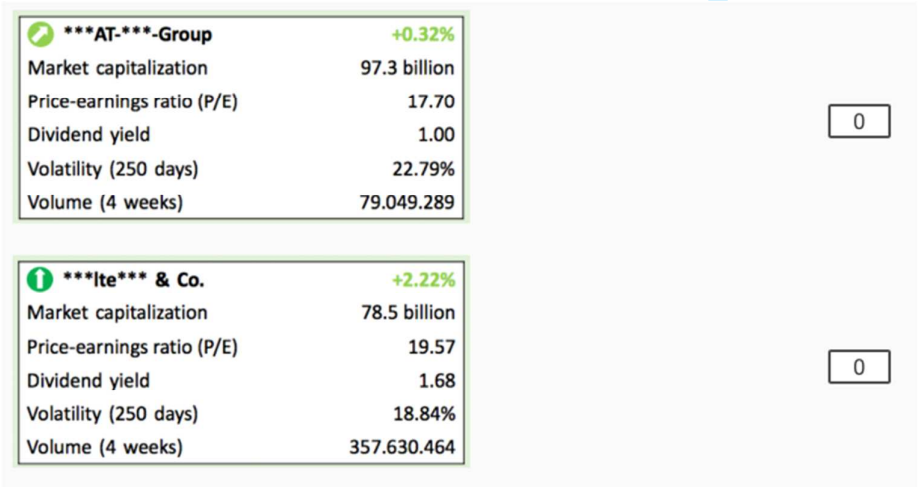
Your assistants will check these projects and provide a recommendation of the 3 most promising projects to you. As the manager, you check their recommendation, accept or reject it, and make the final decision.

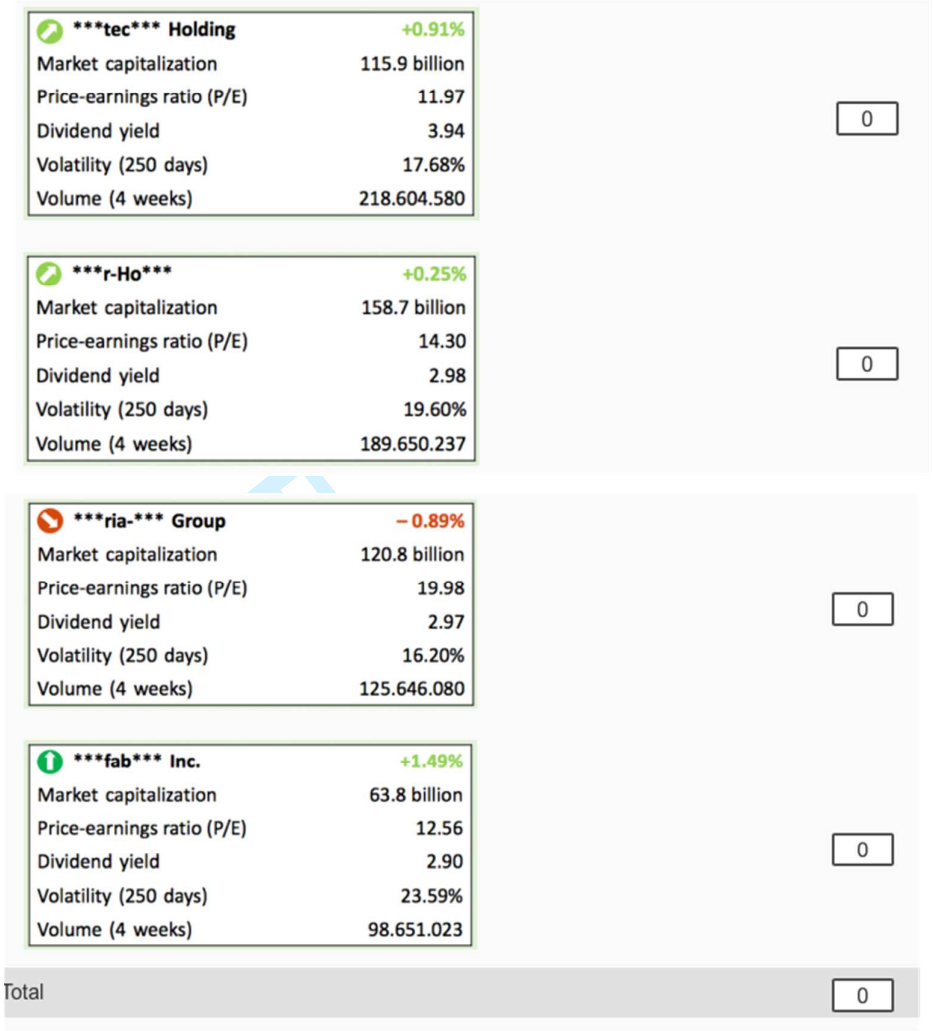
All conditions:

To become acquainted with the task, you first perform an **individual practice trial**: Below, you see examples of six potential projects to invest in.

Now, please:(1) pick 3 projects that seem most promising to you (2) and indicate how much money (in %) out of 100% you would like to spend on each of your 3 chosen projects *typing in a number from 0-100* in the text-box next to each of your chosen projects.

(note: Total = total money spent should add up to 100)





Low power – opportunity // responsibility conditions:

Thank you, this was the practice trial. You will now perform a first round of investments with your manager. Afterwards, you receive feedback on how your investments develop and perform a second round of investments. At the end, the manager evaluates your performance. Please continue.

High power – opportunity // responsibility conditions:

Thank you, this was the practice trial. You will now perform a first round of investments with your assistants. Afterwards, you receive feedback on how your investments develop and perform a second round of investments. At the end, you evaluate your assistants' performance. Please continue.

Assessing threat and challenge towards the task:

All conditions:

Before you start the task: People can perceive tasks providing *such an opportunity // such a responsibility* differently. Please indicate spontaneously:

How do you feel, now that you are about to make your choices *as assistant // as manager*?

Approaching this task, I...

... feel a little threatened. (threat)
... am afraid that I may not master it. (threat)
... am afraid that I may not fulfill my own / others' expectations. (threat)
... am very much up for getting started. (chall)
... feel very stimulated. (chall)
... am sure that I can certainly master it. (chall)
(1 = strongly disagree, 7 = strongly agree)

How do you perceive your role in this situation?

overburdening (threat)

threatening (threat)

stimulating (chall)

as a challenge I can master (chall)

intimidating (threat)

invigorating
(1 = not at all, 7 = very)

Perceived demands and perceived resources

How demanding do you expect the task to be? (demands)

How difficult do you expect the task to be? (demands)

How able do you expect yourself to be to master the task successfully? (resources)

To what extent do you expect to have all the resources you need for this task? (resources)

Power manipulation checks:

As assistant / manager, to what extent do you feel:

passive:active
incompetent:competent (filler)
submissive:dominant
yielding:assertive
unfriendly:friendly (filler)
shy:firm
unassured:self-assured
dependent:independent
hesitant:forceful
unsuccessful:successful (filler)
insecure:self-confident
semantic differential, 9-point scale
--

Thank you very much! You have already reached the end of the business situation and will actually not need to perform the investments any more - we will tell you more about this at the very end of this survey. Finally, please answer some final questions. Afterwards, you will receive a full debriefing and will be compensated.

Instructions and main measures for Experiment 1b

(original materials were in German)

Instructions for power manipulation

(adapted from Guinote, 2007; Inesi et al., 2011; Weick & Guinote, 2010)

In this study, you will complete a number of office tasks. You will collaborate within dyads of one manager and one assistant to create a new construction project for you company, and you will work on ideas from an innovation contest.

First, please complete a couple of questions that will serve to assign you to the most suitable role. [„leadership questionnaire"]

Thank you. Your answers are being processed.

In the following, you will serve one task individually and one task as a dyad. For the daydic task, you will collaborate as manager and assistant. Assistants are good at following instructions and making suggestions. Managers are good at instructing others and evaluating suggestions.

[High power as responsibility condition:] In the following, you will be the manager. Your task will be to instruct and evaluate the assistant. The assistant, vice versa, will not evaluate your work. Accordingly, you have the responsibility to determine your own and the assistant's compensation.

[High power as opportunity condition:] In the following, you will be the manager. Your task will be to instruct and evaluate the assistant. The assistant, vice versa, will not evaluate your work. Accordingly, you have the opportunity to determine your own and the assistant's compensation.

[Low power condition:] In the following, you will be the assistant. Your task will be to follow the manager's instructions and contribute suggestions. Afterwards, the manager will evaluate your work. You will, vice versa, not be in the position to evaluate the manager.

Now, please work on a number of daily office tasks.

1. Task: Innovations

Innovations play a crucial role in many work domains. Yet, the perception and evaluation of innovations can vary between oberservers. Your task now is to evaluate the ideas from a participant of an innovation contest. S/he generated innovative names for new products. The

winner with the best ideas will later receive a price.

We are now interested in how individuals perceive these ideas. You will see a product each with a product name attached to it, which has been generated by the participant from the innovation contest. Please indicate your perception of the product name s/he generated.

[High power as responsibility / opportunity condition:] Your evaluation of the participant's ideas will influence the participants' result. Your evaluation will be entered into an equation including external raters' evaluations and will contribute to 50% of the final evaluation.

[Low power condition:] Your evaluation of the participant's ideas will not contribute to the final evaluation and thus will not influence the participants' result. Yet, this survey may provide information on how innovative ideas are perceived.

[evaluation of the five products with names attached]

Thank you. Please proceed to the second task as a manager / assistant.

2. Task: New projects

In the following, you will work in a dyad with your assistant / manager on a construction project for your company.

[High power as opportunity condition:] Being the manager, you will have the opportunity to instruct the assistant and delegate tasks to him. You are in charge of his work and you are able to evaluate his work afterwards. As manager, you thus have the opportunity to determine your own and the assistant's compensation.

[High power as responsibility condition:] Being the manager, you will have the responsibility to instruct the assistant and delegate tasks to him. You are in charge of his work and you take care of evaluating his work afterwards. As manager, you thus have the responsibility to determine your own and the assistant's compensation.

[Low power condition:] Being the assistant, you will be in the position to follow the manager's instructions and take over tasks from him. The manager is in charge of your work and will evaluate your work afterwards. As assistant, you thus are in the position to contribute suggestions which will be evaluatd by the manager.

Power manipulation check

Please answer the following items:

- On the upcoming task, I will be in charge.
- How much influence will you have, compared to your partner?
- On the task, I will have a subordinate role. [recoded]

You will now be connected to your assistant / your manager to solve the task.
Please wait.

You assistant / Your manager is currently involved in another part of the study. In the meantime, please continue with the second study. You will solve the dyadic task afterwards.

Announced intelligence test to induce threat / challenge

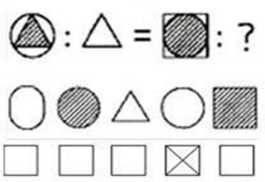
(adapted from Amthauer, R., Brocke, B., Liepmann, D. & Beauducel, A. (2001). I-S-T 2000 R. Intelligenz-Struktur-Test 2000 R (Vol. 2). Göttingen: Hogrefe)

In this study, you will solve various tasks. First, you will complete tasks from a job assessment test. Depending on your performance, you will then solve different other tasks. Moreover, we will ask you how you perceive the tasks. [...]

We will now introduce you to the tasks you will solve. These tasks consist of tasks from a job assessment test. Many companies and universities use these tasks for their entrance examinations.

In this task, the upper row presents two figures, which are ordered in line with a specific rule. The lower row presents you with five other figures to choose from. Your task ist o find out which of these five figures should replace the question mark in the upper row. Below, you see a correctly solved example item. Afterwards, please solve an example yourself on the next screen.

Correctly solved example item:



Here, you see another example item. Please indicate which number represents the correct solution:

[graph similar to example item above]

The following solution is correct:

[graph similar to example item above]

The following test includes 20 tasks with a similar structure and difficulty. You only have 3 minutes to solve these 20 tasks. After working on this task, you will receive feedback on your performance and the next tasks will be determined, depending on how you perform. Please continue.

Main threat / challenge items

Before you begin the task, please answer the following items with regard to the presented task:

- Merely thinking about the difficult tasks is discouraging. (threat)
- I assume that the tasks will be too demanding for me. (threat)
- I am afraid that I won't be able to solve the tasks. (threat)
- I am keen on beginning the task. (chall)
- The difficult tasks motivate me. (chall)
- The tasks urge me to solve them. (chall)

Instructions and main measures for Experiment 2:

(original materials were in Dutch)

Basic instructions for power manipulation, construal induction, and speech task

We will now start the study. Your next task is to give a speech about a memory that is at least a minute long, which will be recorded by the webcam. You will receive more information about what your 'speech′ should be about in the following. Before you start, you will get time to prepare for your speech.

In everyday life, everyone has to do with power. Sometimes you have power over others, but sometimes others just have power over you. How much power you possess varies by situation. Think of family situations, sport situations, work situations or training situations.

[High power as opportunity condition:] Now, please think about a situation in which you had a certain power over others. We want you to pick up a situation in which this power meant an opportunity to pursue your goals. *T*hat is, a situation in which you were independent from others and therefore had more opportunities to achieve your goals.

[High power as responsibility condition:] Now, please think about a situation in which you had a certain power over others. We want you to pick up a situation in which this power meant a responsibility for the fate of the person over which you had power. That is, a situation in which you had influence on another person's well-being, and you thus felt a certain responsibility.

[Low power condition:] Now, please think about a situation in which someone had a certain power over you. With power, we mean that someone had control over something that you wanted, and this someone could determine how you should proceed.

So, think of a family situation, *sport* situation, workplace or training situation.
When you have such a clear situation in mind, then click on '*Continue'*

Now that you've had the instructions and have such a memory in mind, we ask you to relive in the memory. Try to imagine how you felt in this situation, what happened and how you handled best possible way. Before we start recording with the webcam you will soon be given up to 3 minutes to think about what you want to say exactly. Describe the situation as fully as possible. Some tips about what you can tell:

[High power as opportunity condition:] What was the situation? Over whom did you have power? How did you feel having this opportunity? How did you act having this opportunity? Have you reached your goal by your actions?

[High power as responsibility condition:] What was the situation? About whom did you have power? How did you feel having this responsibility? How did you act having this responsibility? Have you reached your goal by your actions?

[Low power condition:] What was the situation? Who had power over you? How did you like it that others had power? How did this feel? How did you act in this situation? Have you reached your goal by your actions?

When you click on continue, your preparation time will start. There is a clock in the picture so you can see how much time you have left. After one minute, it is possible to go ahead and begin the speech, in total you have up to three minutes to prepare.

[Specific instructions on screen while giving the speech]

[High power as opportunity condition:] Describe a situation in which you had a certain amount of power over one or several people, and this power gave you a sense of opportunity because you were independent and could pursue your goals. What was the situation? Who did you have power over? How did you feel having this opportunity? How did you act having this opportunity? Have you reached your goal by your actions?

[High power as responsibility condition:] Describe a situation in which you had a certain amount of power over one or several people, and this power gave you a sense of responsibility because you could decide on their fate, and had your choices affect their welfare. What was the situation? Who did you have power over? How did you feel having this responsibility? How did you act having this responsibility? Have you reached your goal by your actions?

[Low power condition:] Describe a situation in which someone had control over you in getting what you wanted, and this someone could determine how you should proceed. What was the situation? Who had power over you? How did you like it that others had power? How did this feel? How did you act in this situation? Have you reached your goal by your actions?

Measures:

How do the following questions apply to the situation your speech was about?

Power manipulation check:

- I was in charge in this situation.
- I had influence in this situation.

Perceived Responsibility:

- I was responsible for achieving important goals.
- I was aware that others depended on me.
- I could see what my responsibilities were.
- I could make sure that things go well.

Perceived Opportunity:

- I had opportunities for achieving important goals.
- I was aware that I did not depend on others.
- I could see what my opportunities were.
- I could do things the way I wanted.

Instructions and main measures for Experiment 3:

(original materials were in Dutch)

Power and construal instructions:

[High power as responsibility:] You, as a captain, are responsible for the final decisions of the team. So the task of the team captain is to determine the final answer. When you and the advisor have different opinions about the solution, you have the job to take care of the final decision. Besides, the captain will be responsible how to distribute the possible bonus of 25 euro between the two of you. Because of the responsibility of the job as team captain, your decisions have important consequences for you but also for your team player'.

[High power as opportunity:] You, as team captain, have the opportunity to determine the final decisions, which means that you have the chance and the freedom to determine the final answer. When you and the advisor have different opinions about the solution, the team captain has the opportunity to make the final decision. Besides, the captain may decide how to distribute the possible bonus of 25 euro between the two of you. The position of team captain gives you the possibility to define your own outcomes but also the outcomes of your team player.

[High power standard:] You, as team captain, will determine the final decisions, which means that you will determine the final answer.

Power manipulation check:

- In my role as team captain, I had power.
- In my role as team captain, I had control over the outcomes of myself and my teammate.

Felt responsibility / opportunity:

- My position as team captain felt like a responsibility.
- My position as team captain felt like an opportunity.
- As a result of my position as team captain, it was easier to achieve certain goals.
- As a result of my position as team captain, the choices that I made had, and the control that I had, affected the advisor.

7-point Likert-Scales: 1 = strongly disagree to 7 = strongly agree

Supplemental Material:

The Burden of Power: Construing Power as Responsibility (rather than as Opportunity) Alters Threat-Challenge Responses

Preliminary Study: Linguistic threat / challenge indicators

To ensure external validity and provide initial evidence for our hypothesis, leaders recounted a real-life high-power situation at work (Galinsky et al., 2003) while focusing on their responsibility vs. opportunity (similar to Experiment 2 in the paper). We here examined the extent to which participants used threat-/challenge-related *words* to describe the recalled situation, as an indirect reflection how they perceived that situation (Pennebaker, Mehl, & Niederhoffer, 2003; Tausczik, & Pennebaker, 2010).

Method

Participants and Design. One-hundred and seventeen individuals living in the US holding a leadership position (46 female, 1 non-specified; M_{age}=35.26, *SD*=11.63; range: 18-66) were randomly assigned to condition (responsibility: *N*=60; opportunity: *N*=57). Five additional individuals were excluded because they did not fulfill basic study requirements (i.e. did not occupy a leadership position, *N*=3; did not complete the manipulation, *N*=2; including these participants does not change the main findings).

Procedure. Participants were recruited for a 5-minute survey among leaders via amazon mechanical turk. To make their current *power* salient, participants indicated their leadership level, the extent to which they had authority over hiring / firing staff etc. (cf. See et al., 2011). Then, we induced *construal* of high power. Participants recalled a situation in which they had power over someone or several others (e.g., their subordinate; see Galinsky et al., 2003) and in which they had the *responsibility* [vs. opportunity] to control the ability of (an)other person(s) to get something they wanted, or were in a position to evaluate those

individuals. They composed a report on this situation (what had happened, how they had felt, and which *responsibilities* [vs. opportunities] their power came with). Afterwards, participants indicated their power in the recalled situation as a self-reported power check and completed control measures and demographics.

Measures. ***Self-reported power*** comprised two items (e.g., "In this situation, I was in charge"; $r(117)=.82$, $p<.001$; 1=*strongly disagree* to 7=*strongly agree*).

Linguistic threat / challenge indicators. The way how individuals experience a situation is reflected in the words they use to describe that situation (Pennebaker et al., 2003; Tausczik, & Pennebaker, 2010). Accordingly, we focused on participants' use of threat-/challenge-related words when recounting the high power as responsibility- vs. opportunity-related situation. For this purpose, we content analyzed participants' reports using the Linguistic Inquiry and Word Count software (LIWC2007; Pennebaker, Francis, & Booth, 2007). This program calculates the degree to which participants use specific, pre-defined word categories in text (displayed in percent of the complete text). It comprises a comprehensive set of words/word stems from English dictionaries, grouped in word categories that tap psychological constructs (e.g., affect, thinking styles).

We focused on two word categories that most closely represent threat / challenge. As an indicator for threat, we calculated the relative use of words implying taking care of or *protect*ing, monitoring *carefully*, *keep*ing *limit*s, describing *barriers* or *obstacles* etc. (words in italics represent example words for this LIWC 'inhibition'-category). As an indicator for challenge, we examined the relative use of words implying *attempts* to *attain*, *determining* outcomes, reaching *success* / *fail*ure in their actions etc. (words in italics reflect example words for this LIWC approach/'achievement'-category). Note that these two categories are not, strictly, identical to challenge / threat; however, as approach / inhibition are closely tied to challenge / threat (Tomaka et al., 1993; Tomaka & Palacios-Esquivel, 1997) and these two

reflect well-validated categories (Pennebaker, Francis, & Booth, 2007), we focused on these as the most suitable (indirect) challenge / threat indicators.

Results and discussion

Power check. Self-reported power in the recalled situation was higher than the midpoint (i.e., 4) of the scale (M=6.21, SE=.94), $t(116)$=25.30, p<.001. Hence, participants indeed recounted a *high*-power experience. As intended, power did not differ between conditions, $t(115)$=.92, p=.359, d=.17. Participants in the high-power-as-responsibility (M=6.28, SD=.87) and high-power-as-opportunity condition (M=6.12, SD=1.02) perceived a comparable amount of (high) power. Thus, any differences between conditions are unlikely due to differences in the *level* of power, but rather caused by *construal* of power.

Linguistic threat / challenge indicators. We expected participants led to construe power as responsibility (vs. opportunity) to express more *threat* (i.e., use more words from the 'inhibition'-category) and less *challenge* (i.e., use more words from the approach/'achievement'-category) in their essays. A 2 (Construal: opportunity vs. responsibility) x 2 (Expression: challenge vs. threat) mixed analysis of variance with repeated measures on the last factor yielded a main effect of Expression, $F(1, 115)$=175.79, p<.001, η_{part}^2=.61; participants generally expressed more words indicative of challenge (M=6.53, SE=.38) than threat (M=1.41, SE=.15). This pattern was qualified by the predicted Expression x Construal interaction, $F(1, 115)$=11.83, p=. 001, η_{part}^2=.09. Specifically, participants in the high-power-as-responsibility condition expressed more words indicative of *threat* (M=1.92, SE=.21) than in the high-power-as-opportunity condition (M=.90, SE=.22), $F(1, 115)$=11.45, p=.001, η_{part}^2=.09, |Mean Difference (MD)|=1.025, 95% CI=[0.425; 1.625]. In contrast, participants in the high-power-as-responsibility condition expressed less words indicative of *challenge* (M=5.72, SE=.52) than in the high-power-as-opportunity condition (M=7.35, SE=.54), $F(1, 115)$=4.73, p=.032, η_{part}^2=.09, |MD|=1.634, 95% CI=[0.145; 3.122].

The results provide initial evidence that construal of power may, indeed, alter how individuals respond to situations: Leaders who were led to construe power as responsibility (vs. opportunity) verbally expressed more threat and less challenge—as indicated by their relative preference to use more words representing these states. A major strength of this study is its focus on language as concrete (indirect) challenge / threat indicator. Leaders operated in a large variety of settings, ensuring high external validity. Yet, the word categories were closely tied, but not identical, to *actual* challenge / threat. Additionally, by focusing only on leaders, this study precludes conclusions whether this is an effect of *high* power. Experiments 1a-3 sought to address these deficits.

References:

Pennebaker, J. W., Francis, M. E., & Booth, R. J. (2007). *Linguistic inquiry and word count: LIWC*. Austin, TX: LIWC.

Pennebaker, J. W., & King, L. A. (1999). Linguistic styles: Language use as an individual difference. *Journal of Personality and Social Psychology, 77*, 1296–1312.

Pennebaker, J. W., Mehl, M. R., & Niederhoffer, K. G. (2003). Psychological aspects of natural language. use: Our words, our selves. *Annual Review of Psychology, 54*, 547–577.

Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology, 29*, 24-54.

Cardiovascular reactivity – Descriptive statistics for Experiments 2 and 3

Table A. Cardiovascular reactivity scores (Means; *SD*s in brackets) reflecting changes in heart rate (HR), pre-ejection period (PEP), cardiac output (CO), and total peripheral resistance (TPR) from baseline to the speech task (Experiment 2, *N*=81; no covariates included).

	HR	PEP	CO	TPR
Low power	15.93 (9.45)	– 16.32 (13.42)	.57 (.56)	– 382.58 (660.20)
High power as responsibility	20.79 (14.30)	– 12.70 (12.31)	.54 (.60)	– 403.99 (1029.41)
High power as opportunity	19.16 (9.23)	– 16.61 (11.21)	1.11 (1.66)	– 483.88 (734.62)

Table B. Cardiovascular reactivity (Means; *SD*s in brackets) reflecting changes in heart rate (HR), pre-ejection period (PEP), cardiac output (CO), and total peripheral resistance (TPR) from baseline to the speech task (Experiment 3, *N*=54).

	HR	PEP	CO	TPR
High power as responsibility	7.49 (7.35)	– 1.35 (10.74)	.004 (.15)	779.24 (688.61)
High power as opportunity	6.34 (8.30)	– 5.75 (12.47)	.11 (.17)	362.85 (774.02)
High power 'standard'	8.00 (9.88)	– 3.07 (7.02)	.06 (.10)	391.15 (643.50)

Data Transparency Appendix

Please note that the data reported in Experiment 3 of this paper was collected as part of a larger data collection, in which we also examined individuals' tendency to accept advice from others when being in a high-power position. The results thereof go beyond the scope of the current article.

We therefore aimed to report the findings from the data collection in two separate papers. Paper 1 (the current paper) focuses on variables 1, 2, 3, 4, 5, 9 (i.e., physiological indicators as dependent variables). Paper 2 (De Wit, Scheepers, Ellemers, Sassenberg, & Scholl, 2017, Journal of Organizational Behavior) focuses on advice taking (variables 1, 6, 7, 8, 9). In short, the two papers focus on different, non-overlapping outcome measures.

The table below displays which data variable appears in each paper.

	Paper 1 (the present paper)	Paper 2 (De Wit et al., 2017, JOB)
1. Manipulation of construal of high power	**x**	x
2. Heart-rate reactivity (HR)	**x**	
3. Pre-ejection period reactivity (PEP)	**x**	
4. Cardiac output reactivity (CO)	**x**	
5. Total peripheral resistance reactivity (TPR)	**x**	
6. Tendency to take advice		x
7. Confidence		x
8. Value of advice		x
9. Sense of power (manipulation check)	x	x

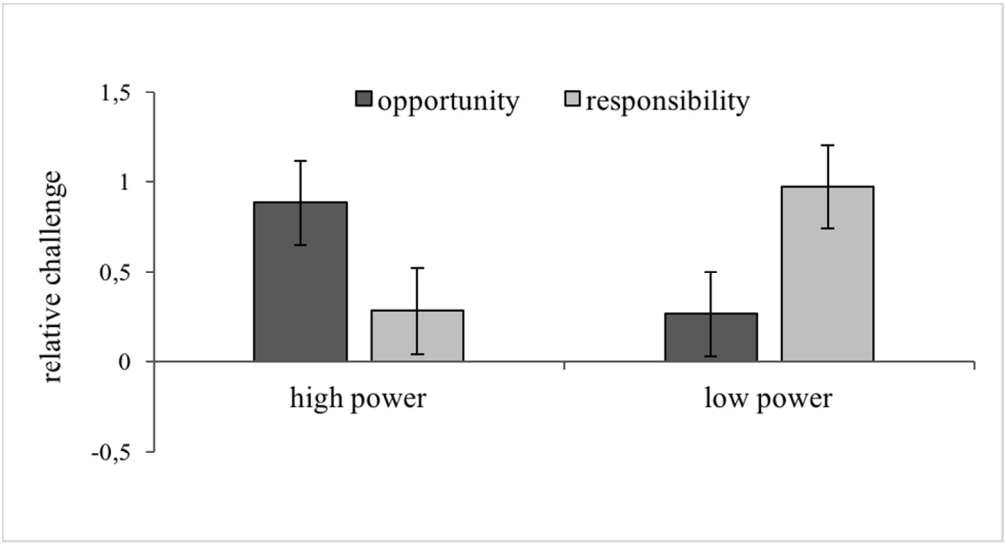


Figure 1a. Relative challenge ratings (higher values indicate relatively more challenge) as a function of Power x Construal (Experiment 1a, N = 304).

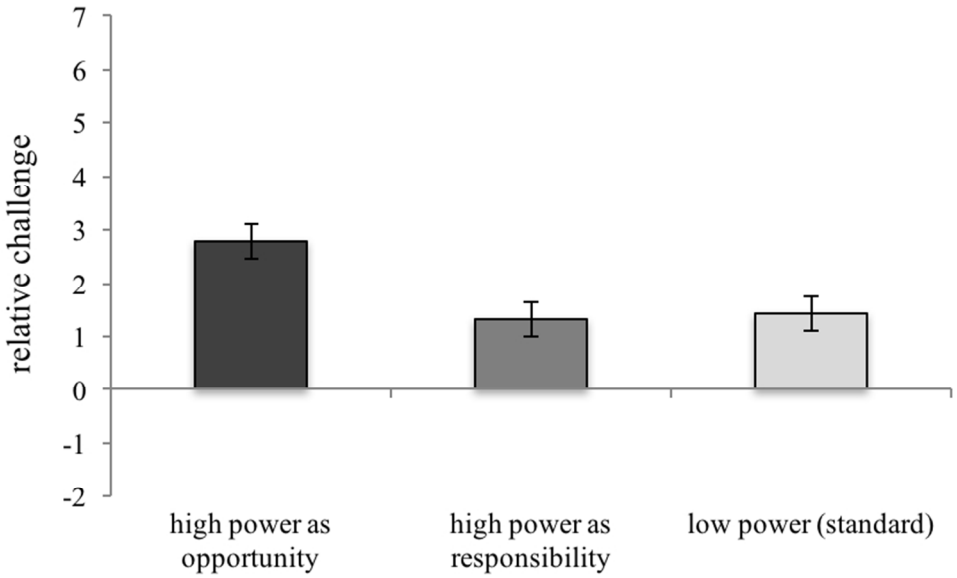


Figure 1b. Relative challenge ratings (higher values indicate relatively more challenge) as a function of Power and Construal of high power (Experiment 1b, N = 135).

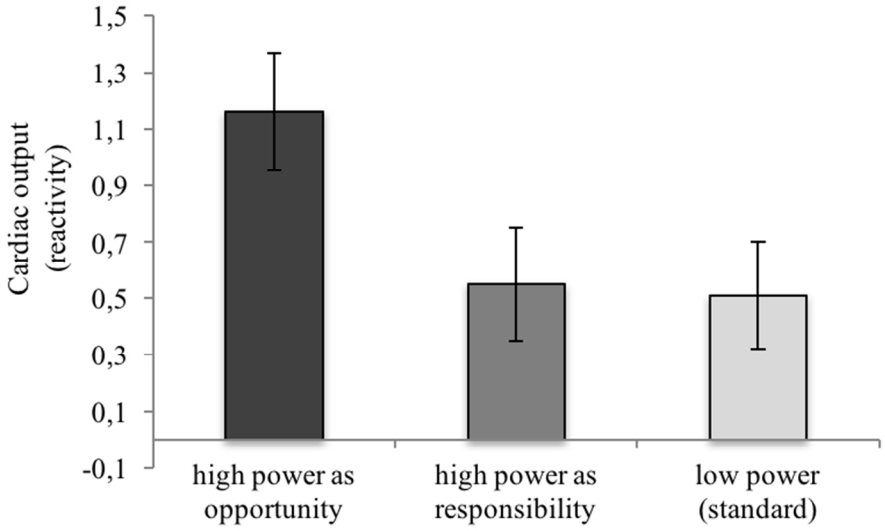


Figure 2a. Cardiac output reactivity (changes for speech over baseline; controlling for speech preparation time) as a function of Power and Construal of high power (Experiment 2, N = 81).

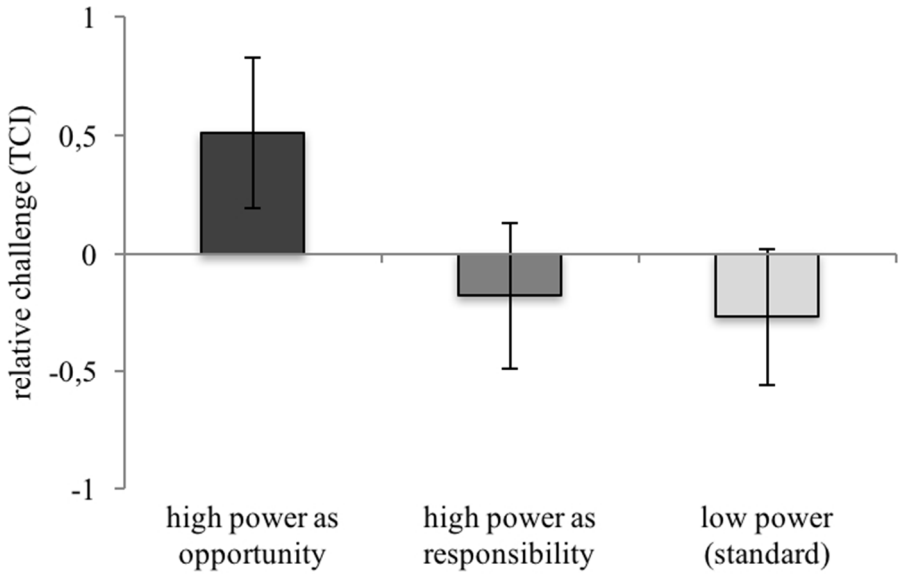


Figure 2b. Relative challenge (TCI=threat-challenge index, higher values indicate relatively more challenge and lower values indicate relatively more threat; controlling for speech preparation time) as a function of Power and Construal of high power (Experiment 2, N = 81).

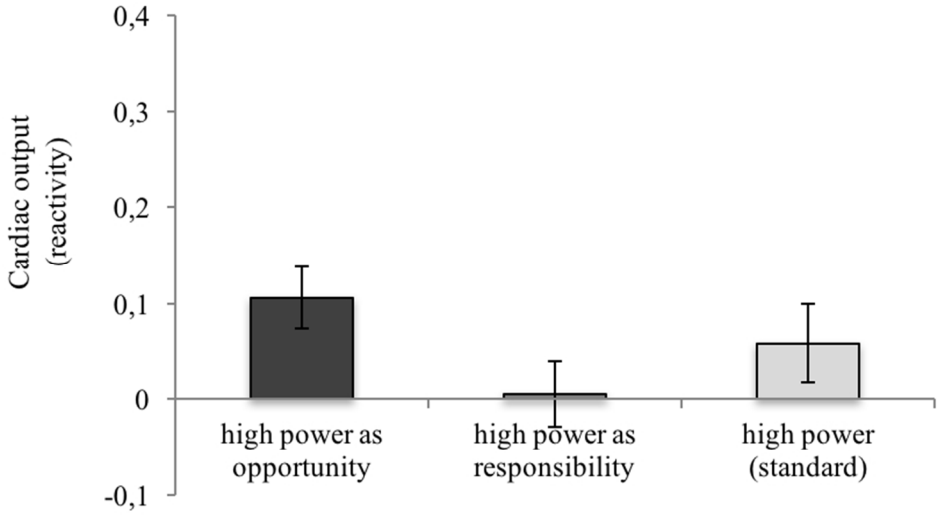


Figure 3a. Cardiac output reactivity (changes for speech over baseline) as a function of Construal of high power (Experiment 2, N = 54).

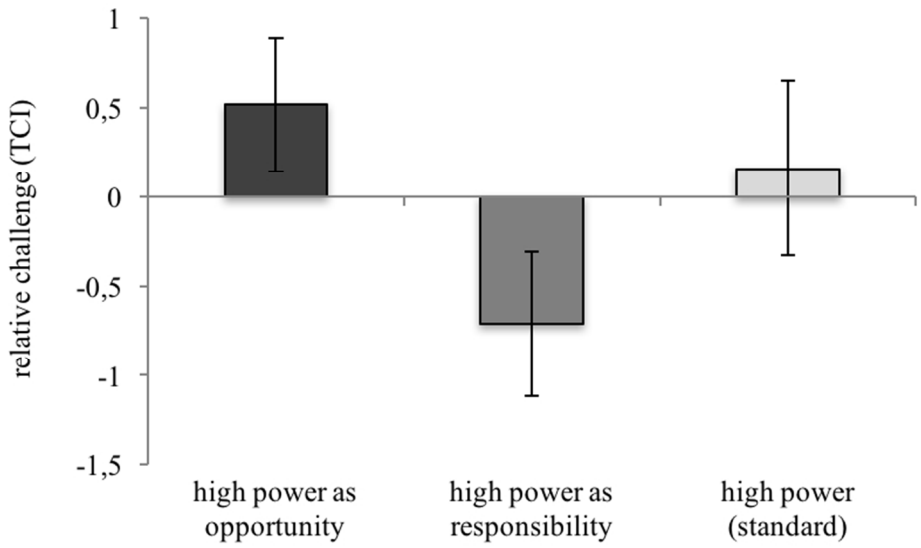


Figure 3b. Relative challenge (TCI=threat-challenge index; higher values indicate relatively more challenge, lower values indicate relatively more threat) as a function of Construal of high power (Experiment 2, N = 54).