The influence of power-orientation on (non)confrontational investment decisions in an interpersonal conflict situation

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Abstract

Humans, being socially competitive animals, are found to engage in predatory attacks in their pursue of personal gain. Attack- and defense behavior has previously largely been studied by use of economic game theory models, but the influence of underlying psychological mechanisms has, thus far, largely been neglected. Additionally, previous studies using game theory models did not include non-confrontational investment options. In the current study, the influence of power-orientation on attack- and defense decision behavior is analyzed by use of a predatory-prey-contest revised to include a non-confrontational investment option. The results show that both power-orientation and being appointed a role as attacker or defender did not influence attack- and defense decision behavior. Furthermore, power orientation did not influence preference to invest in a confrontational- or non-confrontational investment option.

It is known that humans, being social animals, have a competitive nature which creates a natural tendency to engage in predatory attacks to exploit others for personal gain (Bohm, Rusch, & Gureck 2016; Chowdhury, Jeon & Ramalingam, 2018; De Dreu, Kret & Sligte, 2016a; De Dreu, Scholte, Van Winden & Ridderinkhof, 2015). Certain attacks meant to exploit others for personal gain are displayed throughout many levels of society, which makes understanding the dynamics of attack- and defense behavior an important research topic. Think, for example, of political disputes or organizational takeovers. In most of these situations, there is a party that aims to defend what it already has (like protecting an owned company) and an 'attacking' party that aims to gain at the cost of the defending party (like facilitating a hostile takeover). In certain situations, however, investing towards the confrontation ('attacking' or 'defending') is not necessarily the only way to pursue personal gain. Involved parties often have the option to strengthen their position by making self-directed investments as well (like when a company invests in technological development to optimize the production process).

Previously, differences between attack- and defense roles have largely been analyzed by economic theory of production and predation (Duffy & Kim, 2005; Grossman & Kim, 2002; Hirschleifer, 2001). This theory uses models to simulate situations in which parties (or individuals) compete over scarce resources. Some parties are provided the possibility to invest in predatory attack on other parties, in order to gain their resources, while opposing parties have to focus on protecting their resources by investing in defense. A shortcoming of certain studies using economic theory models is that they only include confrontational investment options (directed at exploiting the other person/party), while self-directed (non-confrontational) investments, like mentioned, are

often a viable option in real-life situations as well. Additionally, certain studies predominantly focused on behavioral aspects of attack- and defense roles. The influence of underlying psychological mechanisms has, thus far, largely been neglected by scientific research.

Adding to research on attack- and defense behavior

In order to effectively add to scientific knowledge on attack- and defense behavior and their underlying psychological mechanisms, this study focusses on one such psychological mechanism, namely *power-orientation*. More specifically, this study is guided by the following research question: *How does power-orientation influence (non)confrontational investment decisions in an asymmetrical interpersonal conflict?* In this context, power-orientation refers to the personal sense of power; the degree in which one perceives him- or herself to be capable of influencing others (Bugental, Blue, & Cruzcosa, 1989; Galinsky et al., 2003). Research has shown that high-power oriented people tend to act sooner, more often and regardless of (anti)social consequences (Galinksy & Magee, 2003; Brauer & Bourhis, 2006). Additionally, high power-orientation is associated with aggression, attention to rewards, competitiveness and risk-seeking behavior (Keltner & Gruenfeld, 2003; Wood & Harms, 2017; Keltner & Langner, 2008), whereas low power-orientation is associated with vigilance and threat perception (Keltner & Gruenfeld, 2003). These traits and tendencies have a relevant role in motivating investment decisions in attack- and defense situations. To further support the proposed relevance of power-orientation for attack- and defense behavior, the

following section includes a review of research regarding the psychology underlying attack- and defense behavior.

Findings on psychological mechanisms underlying attack- and defense behavior

In general, predatory attacks meant to exploit others for personal gain are found to only be successful one-third of the time (De Dreu et al., 2016). The low success rate for certain attacks can be explained by the influence of having an attacking- or defending role on decision behavior. De Dreu et al. (2016) showed that defenders tend to be better coordinated and use controlled, systematic information processing, whereas attackers use simultaneous decision making and process information automatically. Also, the motivation to avoid losses is generally stronger than the motivation to gain new resources (Kahneman & Tversky, 1979; Simunovic et al., 2013).

Recently, De Dreu, Giacomantonio, Giffin and Vecchiato (2018) conducted an experiment using an interpersonal Predator-Prey Contest (PPC) (an asymmetric economic game model) to study the influence of two psychological mechanisms that seem to operate during attack- and defense situations; pro-social preferences, and cognitive taxation and shorter decision times. In these PPC's, an attacker and a defender both have to decide how much of a fixed endowment (10 endowments per round) they will invest in attack (for the attacker) or defense (for the defender). Any invested endowments are spent and will therefore be gone, while remaining endowments will be kept. If it turns out that the attacker invested more than the defender, the attacker gains all the defender's remaining endowments of that round. In contrast, if the defender invested more than the attacker, he gets to keep his remaining endowments. The contest consisted of multiple

rounds (60), giving participants a chance to adapt and use different strategies. The results showed that people who reported having strong pro-social preferences attacked less frequently and less forcefully, but ended up wealthier in the economic contest game. Inversely, people with relatively weak pro-social preferences were more aggressive in their attack and attacked more frequently. Additionally, cognitive taxation and shorter decision times were related to more forceful attacks and more victories (De Dreu et al., 2018).

Individual differences in power-orientation could help explain why De Dreu et al. (2018) found a connection between weak pro-social preferences and aggression as well as frequency of attack. High-power oriented people tend to disregard social consequences of their actions, especially when rewards are included (Brauer & Bourhis, 2006; Keltner & Gruenfeld, 2003; Wood & Harms, 2017), so they could be expected to score relatively low on the Ring Measure of Social Value Orientation (Liebrand, 1984; Van Lange, 1999) which De Dreu et al. (2018) used to measure pro-social preferences. Additionally, like previously discussed, aggression and a tendency to act more often (in this case attack more often) are both known to be associated with high power-orientation (Galinksy & Magee, 2003; Keltner & Gruenfeld, 2003). So, instead of viewing weak pro-social preferences as an antecedent for frequent and aggressive attacking behavior, a high power-orientation could have been the underlying factor driving both these participant's attacking behaviors and their pro-social preferences. Moreover, both of these factors could also have been fueled by a general increase in motivation to attack, due to an increased perception of individual gain benefits caused by high power-orientation (Glowacki & Wrangham, 2013; Keltner & Gruenfeld, 2003).

Another finding of De Dreu et al. (2018) was that investments in defense were not predicted by other-concern or empathy, but defenders did generally invest more than attackers. A possible explanation for this finding could be that a low power-orientation, induced by the asymmetric design of the used Predator-Prey Contest (PPC) (defenders had no way of gaining additional resources, they could only hope to successfully defend against predatory attacks), increased defender's vigilance and threat perception. This caused an increased perception of importance of the resources at risk, which in turn increased motivation to defend these resources (Rusch, 2014). Of course, for any of these explanations to work one would have to research how power-orientation influences investment decision behavior in the Predator-Prey Contest and vice versa. Nevertheless, the influence of power-orientation on psychological constructs related to attack- and defense behavior in an asymmetric contest model is clearly relevant.

Revising the Predatory-Prey Contest

To adequately answer the research question, we need to look at the PPC-design used by De Dreu et al. (2018). As previously mentioned, in real life, investments to pursue personal gain do not always have to pertain to aggression towards another party. People in business settings, for example, could also make investments in their own company, like in technological development, additional resources and/or professional consult to generate future advantages, like strategy-improvement or an increase in company value. An important aspect of these self-directed/non-confrontational investments is that they tend to be relatively expensive. Updating company software and technology, for example, usually demands a large investment and the degree of future

advantages is hard to determine exactly. Adding a non-confrontational investment option to studies researching attack- and defense decision behavior would help to resemble real-life situations and, by providing an alternative, could have an important influence on the observed behavior.

In the present study, certain self-directed investments are combined and included in a PPC model under the label 'Invest' -which enables participants to potentially earn a bonus-payment if they allocate enough endowments to the 'Invest' option (determined per round by a randomly generated threshold)-, thereby effectively adding a 'non-confrontational' investment option. To further explain the relevance of this option, we could again use the example of a hostile organizational takeover. In a hostile takeover situation, investing in attack/defense could represent investing money to buy company stocks. For defenders, this is important to prevent an acquiring company from gaining a sufficient amount of company shares to influence the board and/or persuade shareholders to agree with a takeover (Jensen & Ruback, 1983). Attackers, contrarily, would invest to achieve just that. 'Investing', in this case, would represent investing money in the owned company (by defenders) to generate a possible increase in future revenue and satisfy management and shareholders due to that prospect. In short, there's much to gain from making self-directed investments for defenders. If, however, an 'attacking' organization would still acquire enough company stock to realize a takeover, any self-directed investments by the defenders would be lost in the takeover as well. This means that when defending parties increase their worth or revenue through self-directed investments, they increase the chance of getting targeted by attacking organizations (because now, these would gain even more in a takeover situation). Finally, attackers could choose to hold off

the attack and make self-directed investments as well. They would just have the advantage of not having to worry about fending off an ongoing attack while doing so.

The Present Research

So far, this introductory section has focused on the missing non-confrontational investment option, the negligence of psychological mechanisms in scientific research regarding attack- and defense behavior and why power-orientation could very well prove to be an important underlying factor influencing certain behaviors. For example, because high power-orientation is linked to increased risk-seeking behavior (Keltner & Langner, 2008), attention to rewards (Keltner & Gruenfeld, 2003), aggression and competitiveness (Harms, Roberts & Wood, 2007; Wood & Harms, 2017) and low power-orientation lacks association with these traits and tendencies and is linked to vigilance and threat perception (Keltner & Gruenfeld, 2003), it can be expected that people who differ in power-orientation display congruent behaviors in attack-defense situations. Specifically, high-power oriented people could generally be expected to take more risky decisions, while low-power oriented people could generally be expected to take more risk-aversive decisions.

For the current study, a lab experiment was conducted in which participants took part in the revised PPC (including a non-confrontational investment option). During the experiment, both attackers and defender were given three options (‘Challenge/Invest/Keep’) amongst which they could divide their endowments over many rounds. ‘Challenge’ represented the confrontational investment option and ‘Invest’ represented the non-confrontational investment option (this division is explained below).

The ‘Keep’ option represented not investing at all and, thus, keeping the allocated endowments (for that round). By analyzing the results of this experiment and linking them to personal scores on a generalized power-scale, links between power-orientation and attack- and defense behavior during the PPC could be analyzed.

Considering the previously mentioned expectations, a couple of operational hypotheses are developed. Firstly, it is important to understand the interpretation of the investment options per role. For the attackers, a risk-seeking investment represented the ‘Challenge’ option, because the challenge could be lost due to a bigger investment by the defender. This would mean that any allocated endowments to ‘Challenge’ would be lost as well. In theory, attackers could also lose any endowments allocated to ‘Invest’, in case the threshold was not matched or surpassed. However, because attackers didn’t have to worry about fending off an attack from the other party, they were safe to allocate as much endowments as they wanted to ‘Invest’. Consequently, they could practically guarantee receiving the bonus-payment. Compared to defenders, the risk-level of allocating endowments to ‘Invest’ for attackers was so much lower that this could not be considered a risk-seeking investment. For attackers, any allocation to the ‘Keep’ option was guaranteed to be kept, so this represented a risk-aversive option. `

In contrast, for the defenders, any endowments allocated to either ‘Invest’ or ‘Keep’ could potentially get stolen by the attacker in case the challenge of that round was lost. Moreover, allocating endowments to ‘Invest’ or ‘Keep’ meant having less remaining endowments to win the challenge, so allocating to these options always came with a degree of risk. Inversely, allocating to ‘Challenge’ was the only way to preserve any remaining endowments, so this was the safest (risk-aversive) option for defenders.

It is proposed that people with high power-orientations make more risk-seeking investments (Attackers – 'Challenge', Defenders – 'Invest' / 'Keep') compared to people with low power-orientations (*Hypothesis 1a*). In contrast, because low power-orientation associates with opposing traits and tendencies, it is proposed that people with low power-orientations make more risk-aversive investments (Attackers – 'Invest' / 'Keep', Defenders – 'Challenge') compared to people with high power-orientations (*Hypothesis 1b*). Finally, it is proposed that people with high power-orientations generally invest more in confrontational investment options ('Challenge') compared to people with low power-orientations (*Hypothesis 2)*. More detailed information on the research process and relevant analyses is included in the following sections.

Method

Participants. A total of 240 participants (social science students from the Leiden University) were recruited for the lab experiment. Ultimately, six participants were excluded from analysis due to incomplete data caused by minor crashes and errors during the lab experiment. Of the remaining 234 participants, 115 belonged to the 'experimental' group, for whom the non-confrontational investment option ('Invest') was included. For the remaining 119 participants, this option was not included. This 'control' group was included in the lab experiment because this study was embedded in a wider study. However, for this specific study, only the experimental sample (N = 115) was used for analysis. This sample consisted of 93 female and 22 male participants. Ages ranged from 17 to 42 (M = 21.8). The majority of participants was recruited via SONA, the research participation platform of the University of Leiden. Additionally, some participants were

recruited via personal contact and flyers throughout the Leiden University Social Sciences faculty building.

Design. Prior to conducting the actual experiment, participants were asked to complete an online questionnaire, which included the "Sense of Power Scale" (Anderson, John, & Keltner, 2012). This scale measures participant's generalized sense of power and consists of 8 items in the context of general relationships with others (e.g. "*I can get him/her/them to listen to what I say")*, which participants were asked to rate on a scale of 1 (disagrees strongly) to 7 (agree strongly). The full generalized 'Sense of Power Scale' is displayed in the Appendix. To assess the influence of power-orientation on attack- and defense decision behavior, a lab experiment was developed in which participants took part in a Predatory-Prey Contest (PPC). Participants were matched to create dyads and seated in separate cubicles with a computer, on which the PPC would be played. They were then allocated a role as either attacker or defender and were instructed to play 60 sequential 1 vs. 1 rounds of the PPC. In each round, participants were granted 20 endowments (1 endowment equals €0.20, €4 total). Dyad composition, allocated roles and number of investment options remained constant throughout the 60 rounds.

The "Keep" option represented uninvested endowments. These were to be saved and won at the end of the round by attackers. Defender only won the endowments in "Keep" if they allocated more endowments to "Challenge" than attacker did in that same round. Contributions to the "Invest" option generated extra endowments (30) *if* the total contribution exceeded a randomly generated threshold for that round. If the attacker contributed more to "Challenge" than the defender did in that same round, the attacker gained any endowments that were contributed to "Keep" by the defender, plus any extra

endowments the defender potentially gained by earning the invest-bonus in that same round. In contrast, if a defender 'won' the challenge, they got to keep potential endowments gaining through the invest-bonus and whatever endowments they allocated to "Keep". After 60 rounds, the mean earnings over three randomly-chosen rounds were calculated for each participant and converted to a cash bonus (1 endowment = €0,20). For example, if a participant earned 15, 21 and 7 endowments in the three randomly picked rounds, respectively, the cash bonus would be: 15 + 21 +7 = 43/3 = 14.33 * 0,20 = €2,90 (rounded up to units of 10 cents).

Measured Variables. Independent variables in this study were formed by 'Power-orientation' as measured on the 'Sense of Power Scale' and participant role (Attacker / Defender). The sense of power scale consisted of 8 items (α = .80). Power orientation was calculated by adding up the ratings (4 of the items were reversed; "*Even if I voice them, my views have little sway"),* adding up to a score range of 1 – 56 (after reversing some items). This total score was divided by the amount of items (8) to calculated the mean power orientation score. During analysis, participant's mean scores were used. Participants were allocated to either one of two role conditions (attacker / defender). Dependent variables in this study consisted of endowment allocation to each of the following options:

1. "Challenge"
2. "Invest"
3. "Keep"

In order to answer the hypotheses, correlations between mean power orientation and endowment allocation to the three investment options were checked for significance. A more elaborate explanation of the analysis is displayed below.

Informed Consent and Debriefing. Prior to the research process, each participant was to sign an informed consent, in which the general goals and procedures of the research were explained. After the research process, participants received a written debriefing, explaining how the data was analyzed and what exactly was researched, as well as implications regarding the research.

Plan of analysis. After the process of conducting the experiment, all gathered data was processed and studied by use of statistical analyses in SPSS (IBM Corp, 2017). To answer the hypotheses, multiple moderation analyses were conducted using PROCESS model 1 (Hayes, 2013). The results section includes a more detailed explanation of the analysis process.

Results

In order to test the proposed hypotheses regarding the influence of power orientation on attack- and defense decision behavior, multiple moderation analyses were conducted by use of model 1 of the PROCESS macro (Hayes, 2013). Firstly, a moderation analysis was conducted with amount invested to 'Challenge' as dependent variable, participant role as independent variable and mean power orientation as moderator. The overall model proved non-significant $F(3,111) = 1.158$, $\rho = .329$, $R^2 = .03$. The main effects of both participant role ($\beta_{role} =$ -3.280, $t(111) = -.965$, $\rho = .337$, 95% CI [-10.013, 3.453]) and mean power orientation ($\beta_{power} =$ -.586, $t(111) = -.549$, ρ

= .583, 95% CI [-2.698, 1.527]), as well as the interaction effect ($\beta_{role*power}$ = .495, *t*(111) = .732, ρ = .466, 95% CI [-.844, 1.834]) proved insignificant. This means that both mean power orientation and participant role did not influence the amount of endowments invested in 'Challenge' and so, hypotheses 2 ('*People with high power-orientations generally invest more in confrontational investment options compared to people with low power-orientations')* was rejected.

Secondly, a moderation analyses was conducted with amount of endowments allocated to the 'Invest' option as dependent variable, participant role as independent variable and mean power orientation as moderator. Again, the overall model proved non-significant *F*(3,111) = .943, ρ = .423, R^2 = .025. Both main effects proved to be non-significant (β_{role} = .368, *t*(111) = .098, ρ = .922, 95% CI [-7.083, 7.818], β_{power} = .037, *t*(111) = .031, ρ = .975, 95% CI [-2.302, 2.375]) as well, as did the interaction effect ($\beta_{role*power}$ = .096, *t*(111) = .129, ρ = .989, 95% CI [-1.386, 1.578]).

Finally, a moderation analysis with amount of endowments allocated to 'Keep' showed similar results, with the model (*F*(3,11) = 1.286, ρ = .283, R^2 = .034 proving insignificant, as well as the both main effects (β_{role} = 2.913, *t*(111) = 1.269, ρ = .208, 95% CI [-1.640, 7.465], β_{power} = .549, *t*(111) = .762, ρ = .448, 95% CI [-.879, 1.978]) and their interaction effect ($\beta_{role*power}$ = -.591, *t*(111) = -1.293, ρ = .199, 95% CI [-1.497, .315]). These results show that both mean power orientation and participant roles did not influence amounts invested in any of the investments option. Thus, both hypothesis 1a ('*People with high power-orientations make more risk-seeking investments compared to people with low power-orientations'*) and 1b ('*People with low power-*

orientations make more risk-aversive investment compared to people with high power-orientations') were rejected as well.

Discussion

This study focused on the influence of power-orientation on attack- and defense decision behavior in an asymmetrical interpersonal conflict situation. Also, a distinction between confrontational and non-confrontational investment options was made. The results however, indicate that differences in power orientation and/or being allocated a role as either attacker or defender did not influence the amount participants invested in both risk-seeking, risk-aversive and confrontational versus non-confrontational investment options.

The implications of these findings suggest that power orientation, or at least power orientation as measured by the 'Sense of Power scale', does not significantly influence attack- and defense decision behavior in an interpersonal conflict situation, thereby seemingly contradicting scientific belief about the influence of power orientation on decision behavior in an interpersonal context.

Because of this contradictory finding, it is important to look at factors that could have negatively influenced the results in this study. For example, there are various aspects of the sample that could be improved and adjusted in future research, such as the sample size (N = 115), which could have been larger. Additionally, participant backgrounds (almost exclusively students from Leiden university), sex (predominantly females) and age (M = 21.8) could have had an influence on the results. The same goes for aspects of the design, like the amount- and aspects of investment options in the PPC,

which could be larger in order to clearly dissociate between (non)confrontational and risk-related aspects. Additionally, a larger (possibly combined) scale could be used to measure power orientation. The relatively small amount of items used in the current study (8) makes it harder to critically assess variations in power orientation.

Future research should focus on revising the limitations of the current study. The vast amount of scientific knowledge on the influence of power on social behavior seems to indicate an almost certain influence in social conflict/contest situations. Analyzing this influence through game theory could very well be dependent on aspects of the research design.

To conclude, even though people do have competitive natures and do engage in attacks meant to exploit others for personal gain, this study was not able to show that personal degree of power-orientation has an influence on attack- and defense decision behavior. However, considering the vast amount of scientific knowledge on power and its' influence on social interaction, it is not unlikely to assume that, with the appropriate research design, it's just a matter of time before its' influence on attack- and defense decision behavior will become apparent.

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Appendix

Sense of Power Scale Items

In rating each of the items below, please use the following scale:

1. Disagree strongly
2. Disagree
3. Disagree a little
4. Neither agree nor disagree
5. Agree a little
6. Agree
7. Agree strongly

Generalized context (all relationships, groups):

In my relationships with others…

_____1. I can get him/her/them to listen to what I say.
_____2. My wishes do not carry much weight. (r)
_____3. I can get him/her/them to do what I want.
_____4. Even if I voice them, my views have little sway. (r)
_____5. I think I have a great deal of power.
_____6. My ideas and opinions are often ignored. (r)
_____7. Even when I try, I am not able to get my way. (r)
_____8. If I want to, I get to make the decisions.