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The Napoleon Complex: When Shorter Men Take More

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Abstract
Inspired by an evolutionary psychological perspective on the Napoleon complex, we hypothesize that shorter males are more likely to show indirect aggression in resource competitions with taller males. Three studies provide support for our interpretation of the Napoleon complex. Our pilot study shows that men (but not women) keep more resources for themselves when they feel small. When paired with a taller male opponent (Study 1), shorter men keep more resources to themselves in a game in which they have all the power (Dictator) versus a game in which the opponent also has some power (Ultimatum). Furthermore, shorter men are not more likely to show direct, physical aggression toward a taller opponent (Study 2). As predicted by the Napoleon complex, we conclude that (relatively) shorter men show greater behavioral flexibility in securing resources when presented with cues that they are physically less competitive. Theoretical and practical implications are discussed.

Keywords
behavioral flexibility, human height, indirect aggression, Napoleon complex, status, open data

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When a military commander told Napoleon Bonaparte that he felt uncomfortable being so much taller than his Emperor, Napoleon allegedly replied: “You may be taller, but I am greater” (Donker & Burmanje, 2012).[1] This story exemplifies the popular belief, known as the Napoleon complex, that short men compensate behaviorally for a height disadvantage. The origins of the Napoleon complex are unclear, but have been attributed to Alfred Adler’s (1956) inferiority complex theory, which assumes that individuals respond to feelings of inferiority on certain traits by overcompensating on others.

Evolutionary psychology may offer a framework for examining whether the Napoleon complex has a scientific basis. Sexual selection theory suggests that an individual’s physiology and psychology have been shaped by the joint forces of intersexual and intrasexual competition (e.g., Buss & Schmitt, 1993; Puts, 2010), including male height. Tallness increases the ability to attract a potential mate (e.g., Stulp, Buunk, & Pollet, 2013)—an example of intersexual selection, where certain traits are more successful at attracting mates (and producing offspring) than others. Intrasexual selection—competing with rivals for mates—occurs (partially) on male physical characteristics such as strength and size that enable success in combat with other males (Sell, Hone, & Pound, 2012). Taller males have indeed a higher chance of winning physical contests (Archer & Thanzami, 2007). The current research focuses on intrasexual competition, examining dyadic male–male contest behaviors in line with a Napoleon complex.

Height, Status, and Competition

Taller men enjoy several advantages over shorter men, such as a higher social standing in the workplace (e.g., Gawley, Perks, & Curtis, 2009), and are typically healthier and better educated (e.g., Silventoinen, Lahelma, & Rahkonen, 1999). Several studies, across different cultures,

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have found an association between a relatively tall stature and holding a position of power (Handwerker & Crosbie, 1982; Werner, 1982). Ellis (1994a) found, on the basis of 160 studies from preindustrial and industrial societies, a height–status association in humans across multiple cultures, principally for adult men. This height–status association remains after controlling for factors such as nutrition and intelligence (Ellis, 1994b; Persico, Postlewaite, & Silverman, 2004; Silventoinen et al., 1999). Status is also embodied in stature. Men feel taller when assigned to a high-status position (Duguid & Goncalo, 2012), and tall men are seen as holding more status (Blaker et al., 2013; Jackson & Ervin, 1992). For women, the height–status association is either weaker or nonexistent in most reported studies (e.g., Blaker et al., 2013; Gawley et al., 2009; however, see Handwerker & Crosbie, 1982).

Height, together with muscularity, represents men's physical formidability, increasing their (perceived) competitive fighting ability against other males (e.g., Fessler, Holbrook, & Snyder, 2012). For instance, height is positively related to dominant behavior in a sample of Western men (Stulp, Buunk, Verhulst, & Pollet, 2015). However, it is unclear whether height or physical strength better predicts competitive ability: Strength is often not measured (Handwerker & Crosbie, 1982; Werner, 1982) or not mentioned in previous studies (Ellis, 1994a), and studies that measured both height and strength resulted in mixed findings (for a more detailed description, see Section 1 in the Supplemental Material). Archer and Thanzami (2007) suggest that height is a stronger predictor of competitive ability, while Sell et al. (2009) and von Rueden, Gurven, and Kaplan (2008) suggest that strength is the main predictor. Recent research showed that cues of physical formidability—both height and strength—lead to increased status allocation, presumably because people use formidability as a cue to specific leadership abilities (Lukaszewski, Simmons, Anderson, & Roney, 2016). As we focus on the Napoleon complex, our studies concern the impact of height, not strength, on competitive male–male interactions.

The Napoleon Complex

It has been argued that men have a flexible status psychology that allows them to calibrate their behavior to opportunities in the environment for status enhancement (Van Vugt & Tybur, 2014). [AQ: 4] Thus, being shorter and less formidable than a competitor should alter the tradeoffs associated with various physical and nonphysical strategies to compete. We hypothesize that—recognizing a situation in which they are physically outcompeted—shorter males will turn to alternative strategies to win contests (i.e., behavioral flexibility; Zaccaro, Gilbert, Thor, & Mumford, 1991). Though there are many examples of such alternative strategies (forming coalitions, deception), for this first investigation into a potential Napoleon complex we will examine whether shorter males behave more indirectly aggressively toward a taller opponent (i.e., by disadvantaging them in a nonphysical way). Indirect forms of aggression to disadvantage opponents entail, for instance, gossiping or securing resources in an unobtrusive manner (Archer & Coyne, 2005; Cummins, 2006), and, unlike direct aggression, pose no or limited physical risk to the aggressor—it is "the safer option" (Campbell, 1999).

The current research examines the Napoleon complex hypothesis in settings in which male dyads compete with each other over resources in economic games. We expect that shorter men will behave more indirectly aggressively by taking valuable resources from a taller opponent. We predict this Napoleon complex psychology to be activated under the following conditions: (a) men are competing for resources intrasexually; (b) shorter men are paired with taller rivals; (c) the height difference is salient and internalized; and (d) the costs of disadvantaging the opponent through indirect aggression are reasonably low (e.g., without risk of retaliation or physical aggression).

Overview of Studies

We first present a pilot study, which formed the motivation to conduct our two main studies. Then, in Study 1, we test our predictions by comparing behavior in a Dictator Game (DG) versus an Ultimatum Game (UG). In the DG, one player has unconditional power over resource allocation, while in the UG that player's allocation decision can be rejected—thus posing a risk of retaliation by the opponent. The main expectation is that shorter men take more resources in the DG, but not necessarily in the UG. Economic games can be used to mimic actual resource contests (Cummins, 2006), as individuals tend to behave in these economic games as if they are in real physical encounters (Van Lange, Joireman, Parks, & Van Dijk, 2013). Participants meet each other in dyads before the game to get a sense of relative height differences, which should activate a Napoleon complex psychology among the shorter men. To increase the competitiveness of the games, the allocators can take the money—rather than give it away—and the leftovers will automatically go to their opponent (Bardsley, 2008). In Study 2 we test how height affects indirect aggressive behavior (DG) and physical aggression (hot sauce task; Lieberman, Solomon, Greenberg, & McGregor, 1999), and expect that shorter men will be more indirectly aggressive, but not more physically aggressive than tall men.

Pilot Study

Method

Sixty participants, 43 women, took part in a study at the University of Groningen (M_{age} = 20.90 years, SD_{age} = 2.18 years). They were paid €2, plus what they decided to take home from the DG. The independent measures were "Did you ever feel small?" measured on a seven-point Likert scale (1 = never, 7 = often; *M* = 2.55, *SD* = 1.79), self-reported height in centimeters (males: *M* = 187.65 cm, *SD* = 6.68 cm; and females: *M* = 173.05 cm, *SD* = 6.19 cm), and participant sex. The main dependent measure was the amount of €1 coins left behind for others in the DG (*M* = 2.68, *SD* = 1.88).

Participants were led into a cubicle, and read all instructions on paper. They completed a paper-and-pencil questionnaire with sociodemographic questions including the measures on their height and read the instructions for the DG. The money for the DG, in coins, was placed in an envelope. Participants read in the instructions that the envelope contained eight €1 coins and that they could choose to leave behind as many coins as they would like and that we would give away what they left behind to someone else (a participant like them in the experiment or a person on campus—they did not know the identity of the recipient). They were instructed to seal the envelope and leave this behind in the experimental room. There was no deception and the money was either allocated to other participants or people on campus. After participation, all participants were thanked and debriefed via email.

Results

We tested the effect of participant height (in centimeters) and feeling small on the number of coins given away in the DG (with a constant of 1 added to avoid values of 0), with a generalized linear model with a Poisson distribution (GzLM, corrected for overdispersion in IBM SPSS 21.0 [AQ: 5]). Due to the modest correlation between self-reported height and feeling small ($r = .365$, $p = .004$), separate analyses were run for these two predictors. Also, participant sex was added to each model, along with the interaction between sex and height/feeling small, as we expected to mainly find an effect among male participants.

There was a significant effect of feeling small on number of coins given away in the DG, Waldχ^2 = 4.85, $p = .028$, while participant sex did not predict coin allocation, Waldχ^2 = .18, $p = .673$. Furthermore, there was a significant interaction between participant sex and feeling small on coin allocation, Waldχ^2 = 4.83, $p = .028$. Parameter estimates showed that feeling small led to a decrease in coins allocated to others for male

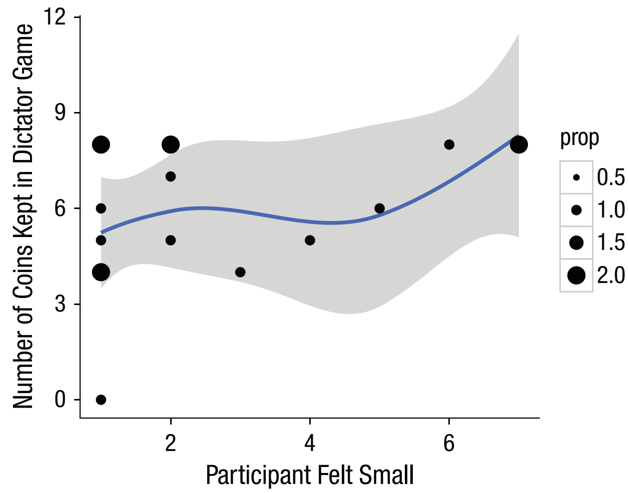

Fig. 1. Raw data and locally weighted (LOESS) regression line (95% CI, span = 1) of number of coins kept for self in the Dictator Game regressed on "feeling Small" by males.

participants, Waldχ^2 = 6.20, $b = -.161$, $se = .065$, 95% confidence interval (CI) = [−.288, −.034], $p = .013$; but not for female participants, Waldχ^2 <.001, $b < .001$, $se = .034$, 95% CI [−.068, .067], $p = .996$. Applying a bootstrapping procedure (1,000 resamples, 95% CI bias corrected and accelerated) corroborated the finding that male participants who felt smaller gave away fewer coins, $b = -.161$, $se = .085$, 95% CI [−.315, −.011], $p = .029$ (Fig. 1).

Self-reported height in centimeters did not predict coin allocation, Waldχ^2 = 0.06, $p = .939$ (controlling for participant sex, Waldχ^2 = 0.32, $p = .570$). There was also no interaction between participant sex and absolute height on coin allocation in the DG, Waldχ^2 = 0.27, $p = .602$.

This first pilot study thus established that feeling small significantly affected men's allocations in the DG (but not women's). We did not find an effect of absolute height on resource allocation in the DG. However, there was no competitive context; the DG was played with an anonymous other, and opponent height or relative height was not included in the design of the pilot study. Therefore, in Study 1 we examine the effects of own and opponent stature in a dyadic male–male competitive context, and manipulated the possibility of retaliation by the opponent.

Study 1

Method

The data-collection strategy for Study 1 was to get as many participants as possible, within the two weeks the lab was available for this project. Forty-two male participants (M_{age} = 23.02 years, SD_{age} = 2.98 years; M_{height} = 182.98 cm, SD_{height} = 6.79 cm) completed the study at the Vrije Universiteit Amsterdam, in return for €5 or course credits (excluding a bonus for playing economic games). Participants were paired up during the study (21 dyads; all pairs were strangers) with an "opponent." The independent variables in the main model were participants' own height in centimeters and their opponent's height in centimeters. An additional model considers the participants' relative height in centimeters (own height subtracted by opponent height). The main dependent variables were the amount of coins (out of 18) participants kept for themselves in a DG (M = 12.62, SD = 4.05), and the amount of coins (also out of 18) participants kept for themselves in a UG (M = 10.24, SD = 1.91). Also, the difference in coins kept for self in the two games was calculated as an additional dependent variable (coins kept for self in the DG subtracted by coins kept for self in the UG). The "coins" that participants played the economic games with in this study were poker chips worth €0.10 each.

In each session, two male participants stood opposite each other for approximately 10 seconds, were introduced as each other's opponent, and then led off to separate cubicles for the duration of the study. Participants first played a one-shot DG followed by a one-shot UG, where in each game they divided 18 coins. Although participants were told they were chosen to divide the money between themselves and their opponent during the games, both participants were actually given the allocator role. When making decisions for the UG, participants did not know that their opponent had allocated them money in the DG. Participants were told their opponent would leave the lab separately following the study. The games were framed in a "taking" rather than a "giving" way; participants were told the money was theirs to take, and the leftovers would automatically go to the opponent (see also Bardsley, 2008). In the DG, participants could anonymously take as many coins as they wanted without consequences, while in the UG the opponent had the opportunity to see how much was taken by the other and accept or reject the division (in the case of rejection, both participants are left with nothing). Participants also filled out demographic information, including their height in centimeters, as well as age and self-reported socioeconomic status (SES, α = .62, as used by Griskevicius, Tybur, Delton, & Robertson, 2011). Finally, participants were debriefed and paid.

Results

For the specific syntax used for Studies 1 and 2, please see Section 2 of the Supplemental Material. We used generalized estimating equations (GEE) (in IBM SPSS statistics 23) to analyze all data in Studies 1 and 2, which enabled us to take the dyadic structure of the data into account, and specify a Poisson loglinear (for the economic games, always corrected for overdispersion) or a normal distribution. The independent variables are added to the model as fixed effects one at a time, and both parameter estimates and an indicator of model fit (corrected quasi information criterion, or QICc) are reported. Lower QICc values indicate superior model fit (see Pan, 2001). Note that the own/opponent height variables are not independent from the relative height variable, and are thus never included in the same model. Own height significantly correlated with SES, r = .33, p = .031, indicating that taller participants had higher SES. If a height variable had a significant effect on behavior in either economic game, we repeated the analysis with SES as a covariate.

Dictator Game. We reverse-scored the dependent variable (amount of coins kept for self in the DG) and added a constant (1) in order to better fit a Poisson distribution and to avoid values of zero. QICc values in this section represent the model fit after adding the mentioned independent variable as a fixed effect (unless explained otherwise), and should be compared to the intercept-only model (QICc = 124.63) or each other.

Own height was added as a fixed factor, which had a significant effect on coins kept for self in the DG, Waldχ^2 = 7.03, b = .025, se = .009, 95% CI [.007, .044], p = .008 (QICc = 117.00), indicating that shorter participants kept more coins for themselves (see Fig. 2). Opponent height was then added to the model, but had no significant effect on coins kept for self in the DG, Waldχ^2 = 1.61, b = −.016, se = .013, 95% CI [−.041, .009], p = .205 (QICc = 115.84). Own height remains a significant predictor after controlling for opponent height and SES, Waldχ^2 = 5.42, b = .027, se = .012, 95% CI [.004, .050], p = .020. SES is not significantly related to behavior in the DG, Waldχ^2 = 0.61, b = .092, se = .118, 95% CI [−.139, .323], p = .436. Finally, there was no significant interaction between absolute height and opponent height, Waldχ^2 = 0.13, b = .001, se = .001, 95% CI [−.002, .003], p = .718 (QICc = 117.75). Thus, shorter participants (regardless of their opponent's height) kept more coins for themselves in the DG.

Adding relative height as a predictor to the intercept-only model showed that the shorter a participant was compared to their opponent, the more coins they kept for themselves in the DG, Waldχ^2 = 5.58, b = .023, se = .010, 95% CI [.004, .042], p = .018 (QICc = 114.75). The relative height model showed the best model fit (lowest QICc value), but the effect of relative height is likely driven largely by participants' own height, considering the separate effects of own and opponent height.

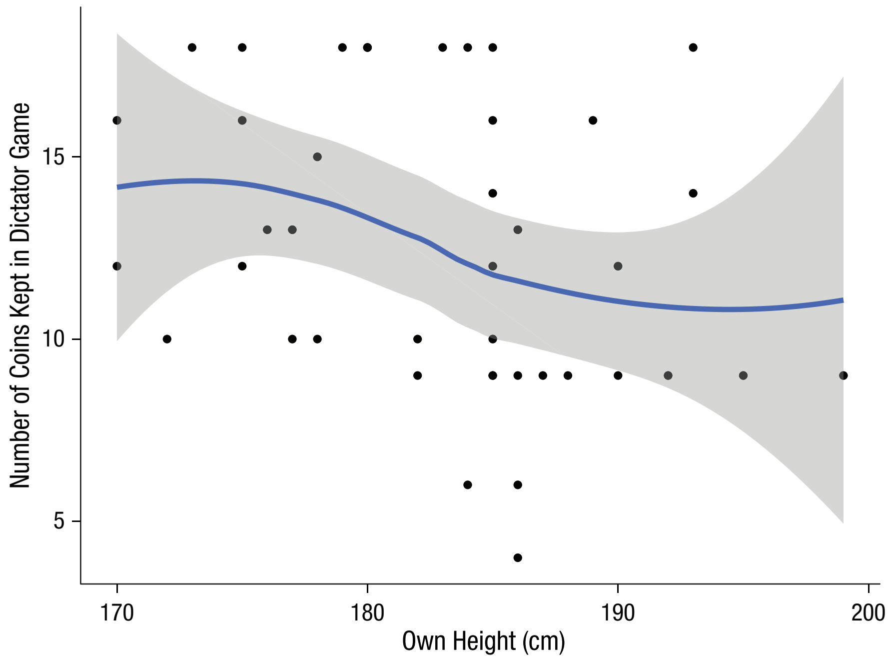

Fig. 2. Raw data and locally weighted (LOESS) regression line (95% CI, span = 1) of number of coins kept for self in the Dictator Game regressed on own height in centimeters in Study 1.

Ultimatum Game. Of the 42 UG offers, 7 were rejected and 35 were accepted. We transformed amount of coins kept for self in the UG in the same manner as coins kept for self in the DG (reverse-coded, plus a constant of 1). The QICc values of the models reported in this particular section can be compared to the intercept-only model (QICc = 21.63), or to each other.

Own height (added as a fixed effect to the intercept-only model) had a marginally significant effect on coins kept for self in the UG, Waldχ^2 = 3.53, *b* = .005, *se* = .003, 95% CI [<.001, .011], *p* = .060 (QICc = 22.93), suggesting a trend in which shorter participants kept more coins for themselves. Opponent height was subsequently added as a fixed effect, which was not significantly related to amount of coins kept for self in the UG, Waldχ^2 = 1.54, *b* = .004, *se* = .003, 95% CI [−.002, .011], *p* = .215 (QICc = 24.62). The effect of own height was significant when controlling for opponent height and SES, Waldχ^2 = 8.20, *b* = .008, *se* = .003, 95% CI [.003, .014], *p* = .004. SES was not significantly related to coins kept for self in the UG, Waldχ^2 = 2.41, *b* = −.062, *se* = .040, 95% CI [−.141, .016], *p* = .121 (QICc = 26.23).

We tested the interaction between own height and opponent height by adding the interaction term as a fixed effect to the model with own height and opponent height as predictors (mean centered). There was a marginally significant interaction between own height and opponent height on coins kept for self in the UG, Waldχ^2 = 3.83, *b* = −.001, *se* = .001, 95% CI [−.002, <.001], *p* = .051 (QICc = 26.16). Simple effects showed that when a participant's opponent was shorter than average (1 SD below mean), shorter participants kept more coins for themselves in the UG, *b* = .014, *se* = .005, 95% CI [.004, .023], *p* = .005. However, shorter participants did not keep more coins for themselves in the UG when their opponent was taller than average (1 SD above mean), *b* = .001, *se* = .004, 95% CI [−.007, .009], *p* = .846.

Finally, we added relative height as a fixed factor to the intercept-only model, which showed there was no significant relationship between relative height and coins kept for self in the UG, Waldχ^2 = 0.42, *b* = .001, *se* = .002, 95% CI [−.002, .005], *p* = .519 (QICc = 23.58). Like in the DG, shorter males may keep more coins to themselves in a UG. However, their opponent's height may also play a role in the decision-making process.

Dictator versus Ultimatum Game. To test whether there is a significant effect of height on the different actions of participants in the two economic games, we repeated our analyses with the amount of extra coins that each participant kept in the DG compared to the UG as the dependent variable (z-score of coins kept in DG minus z-score of coins kept in UG). On average, participants kept more coins to themselves in the DG compared to the UG (*M* = 2.38, *SD* = 3.42). The same GEE procedure as before was used, taking into account the dyadic structure of the data, except instead of a Poisson loglinear distribution a normal distribution was specified, and standardized variables were used. The QICc values in this specific section should be compared to the intercept-only model (QICc = 39.63) or to each other.

Own height was added as a fixed effect to the intercept-only model. Own height had no significant effect on selfish behavior in the DG compared to the UG, Wald χ^2 = 0.66, *b* = −.100, *se* = .123, 95% CI [−.341, .141], *p* = .417 (QICc = 41.22). Subsequently, opponent height was added to the own height model. There was a significant effect of opponent height, indicating that participants kept more coins for themselves in the DG compared to the UG when their opponent was taller, Wald χ^2 = 6.06, *b* = .300, *se* = .122, 95% CI [.061, .539], *p* = .014 (QICc = 39.54; with opponent height as the only fixed effect, QICc = 39.05). The effect of opponent height remained significant after controlling for SES (and own height), Wald χ^2 = 7.19, *b* = .316, *se* = .118, 95% CI [.085, .547], *p* = .007 (QICc = 40.35). SES was marginally significantly related to coins kept for self in the DG versus the UG, Wald χ^2 = 3.09, *b* = −.182, *se* = .103, 95% CI [−.384, .021], *p* = .079, suggesting a trend in which participants with lower SES keep more coins to themselves in the DG versus the UG. Finally, there was no significant interaction between own height and opponent height, Wald χ^2 = 1.75, *b* = −.193, *se* = .146, 95% CI [−.479, .093], *p* = .186 (QICc = 40.50).

We tested the effect of relative height by adding it as a fixed effect to the intercept-only model. The shorter a participant was compared to their opponent, the more coins they kept for themselves in the DG compared to the UG, Wald χ^2 = 5.40, *b* = −.281, *se* = .121, 95% CI [−.518, −.044], *p* = .020 (QICc = 38.39).

Results showed that shorter participants kept more coins to themselves in a DG, regardless of their opponent's height. Though relatively shorter participants also kept more coins for themselves, this effect is likely strongly driven by their own height. In the UG, shorter participants kept more money to themselves, but not when their opponent was taller than average. On average, participants kept more coins for themselves in the DG compared to the UG. The taller the opponent, the more coins participants kept for themselves in the DG compared to the UG. Own height had a similar effect in the two economic games, but opponent height was more important in the UG than in the DG. In Study 2, we look at behavior in the DG with a larger sample, and add a measure involving direct, physical aggression (the hot sauce task; Lieberman et al., 1999).

Study 2

Method

For Study 2 we set a goal to recruit 80 pairs of men. One hundred and sixty-four participants (82 pairs of men) took part in the study, and data were collected in three waves—in April 2012, April 2013, and April 2014. See Section 3 of the Supplemental Material for more information on data collection. Participants (M_{age} = 22.02 years, SD_{age} = 2.72 years; M_{height} = 182.42 cm, SD_{height} = 8.03 cm) were recruited at Vrije Universiteit Amsterdam and via the contacts of students involved in the project for their thesis. The study was conducted with pairs of male participants, who acted as each other's opponent, and who did not know each other. Own height in centimeters and opponent height in centimeters were the main independent variables, and relative height was again an additional independent variable (own height minus opponent height). The main dependent variables were the amount of coins kept for self in the DG and (non-instrumental) direct aggression, as measured by amount of hot sauce allocated to the opponent in a hot sauce task (see Lieberman et al., 1999).

As in Study 1, participants were brought into the lab in pairs, stood opposite each other for several seconds, and were told the other participant was their opponent. Height in centimeters was then measured with a stadiometer (medical height measurement device), and read aloud to ensure that any height differences were known and salient to the participants. Next, participants were seated in separate closed cubicles and were assured they would not meet the opponent face-to-face again. Other physical measures were taken to "mask" the importance of height and to boost a sense of competition. Handgrip strength was measured in the cubicle with a hand dynamometer (result not read aloud or included in the study due to a defective hand dynamometer), and an experimenter took a photo of participants' faces. In the cubicle, participants first completed some sociodemographic questions (also including the question "Do you ever feel small?") and then proceeded to participate in a DG and a hot sauce allocation task (order of the tasks was counterbalanced).

The procedure of the DG was identical to the DG in Study 1, except that participants now divided 15 coins (instead of 18). The "coins" in this DG were again poker chips worth €0.10 each. The hot sauce task was adapted from Lieberman et al. (1999). Participants were told this was a "taste test," in which they would prepare a food sample for their opponent. Participants inserted (with a syringe) an amount of hot sauce between 0 and 5 ml into a small cup of water for their opponent to drink. A larger amount of hot sauce indicates higher levels of aggression toward the other. Note that the original hot sauce paradigm was designed to be a measure of reactionary aggression, but in this study participants gave the hot sauce in response to no particular transgression. However, the competitive atmosphere created (by being branded opponents) could create a similar effect (e.g., Adachi & Willoughby, 2011).

Results

An independent samples *t* test showed that participants who reported a non-Caucasian ethnicity (M = 178.41 cm, SD = 9.59) were significantly shorter than the Caucasian participants (M = 183.98 cm, SD = 6.76), $t(63.18) = 4.19$, $p = .001$. If a height variable had a significant effect on behavior in the DG or the hot sauce task, we tested its robustness by repeating the analysis with participant ethnicity as a covariate. As with Study 1, relative height is always tested in a separate model to absolute and opponent height.

Dictator Game. To analyze height effects on behavior in the DG, we used GEE (Poisson loglinear, corrected for overdispersion, dyadic structure specified—see Section 2 of the Supplemental Material for syntax), adding one fixed effect at a time. The dependent variable (coins kept for self in the DG) was reverse-coded and a constant (1) was added to better fit a Poisson distribution. The model fit values reported in this section can be compared to the intercept-only model (QICc = 331.15), and to each other.

In line with Study 1, own height had a significant effect on coins kept for self in the DG, Waldχ^2 = 4.38, b = .009, se = .004, 95% CI [.001, .018], p = .036 (QICc = 326.18), indicating that shorter participants kept more coins for themselves in the DG (see Fig. 3). Opponent height was then added to the model. Opponent height did not significantly affect coins kept for self in the DG, Waldχ^2 = 1.34, b = −.006, se = .005, 95% CI [−.015, .004], p = .247 (QICc = 325.85). The effect of own height remained significant after controlling for ethnicity and opponent height Waldχ^2 = 4.27, b = .010, se = .005, 95% CI [.001, .019], p = .039 (QICc = 327.06), and ethnicity was not significantly related to behavior in the DG, Waldχ^2 = 0.37, b = −.064, se = .106, 95% CI [−.272, .143], p = .542. Subsequently, we added the interaction term to the model with own height and opponent height as fixed effects, which was not significant, Waldχ^2 = 1.00, b = −.001, se = .001, 95% CI [−.002, .001], p = .317 (QICc = 326.51).

Next, we added relative height as a fixed effect to the intercept-only model. Results showed that a shorter relative height was related to more coins kept for self in the DG, Waldχ^2 = 5.03, b = .008, se = .004, 95% CI [.001, .015], p = .025 (QICc = 324.90). The relative height model showed the best fit (lowest QICc), but its effect is likely driven more by participants' own height than the opponent's height, considering their separate effects. Finally, the effect of feeling small was tested by adding the variable to the intercept-only model—feeling small was not significantly related to behavior in the DG, Waldχ^2 = 0.08, b = −.006, se = .022, 95% CI [−.050, .037], p = .781 (QICc = 333.06).

Hot sauce allocation task. To analyze height effects on behavior in the hot sauce task, we used GEE (normal distribution, dyadic structure specified, standardized variables).

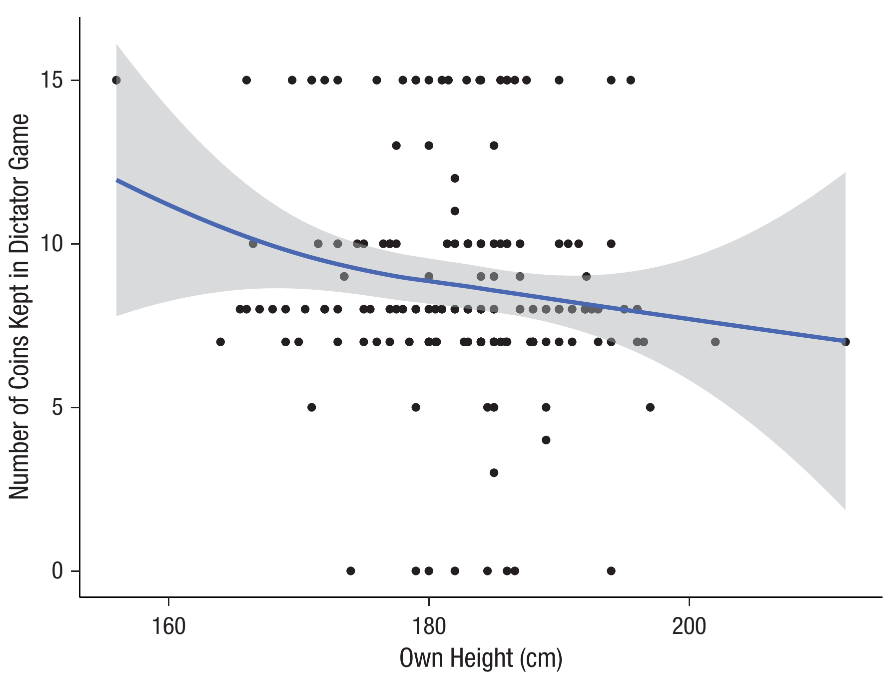

Fig. 3. Raw data and locally weighted (LOESS) regression line (95% CI, span = 1) of number of coins kept for self in the Dictator Game regressed on own height in centimeters (height participant – height others).

The QICc values in this section can be compared to the intercept-only model (QICc = 165.00) and to each other. First, own height (added as a fixed factor to the intercept-only model) had no effect on aggressive behavior, Waldχ^2 = 0.10, *b* = −.024, *se* = .074, CI [−.169, .122], *p* = .749 (QICc = 166.91). Opponent height was then added as a fixed factor, which also did not have a significant effect on aggressive behavior, Waldχ^2 = 2.36, *b* = −.117, *se* = .076, CI [−.266, .032], *p* = .125 (QICc = 166.77). The interaction term was added, which showed there was no interaction effect between own and opponent height on aggressive behavior in the hot sauce task, Waldχ^2 = 0.58, *b* = .070, *se* = .092, CI [−.110, .249], *p* = .446 (QICc = 168.10). Additionally, feeling small (added as a fixed factor to the intercept-only model) was not significantly related to behavior in the hot sauce task, Waldχ^2 = 0.63, *b* = −.020, *se* = .078, CI [−.172, .133], *p* = .802 (QICc = 166.94). Finally, there was no effect of relative height (added as a fixed factor to the intercept-only model), Waldχ^2 = 1.45, *b* = .074, *se* = .061, 95% CI [−.046, .193], *p* = .228 (QICc = 166.12).

Replicating the results of Study 1, Study 2 showed that shorter participants kept more coins for themselves in a DG. Again, opponent height did not significantly affect resource allocation in the DG. Shorter relative height was also significantly related to keeping more coins in the DG, though this is expected to be mainly driven by the effect of own height. Feeling small had no effect on behavior in the DG. None of the height variables were significantly related to physically aggressive behavior in the hot sauce task.

Studies 1 and 2: Combined Data Analysis

In this section, we show the effect of height on behavior in the DG by combining the data from Studies 1 and 2. The independent variables were own height, opponent height, and relative height. The dependent variable was the percentage of coins kept for self in the DG (maximum number of coins to keep was 18 for Study 1 and 15 for Study 2). As before, we used GEE (normal distribution, dyadic structure specified, standardized variables) to analyze the data. Model fit statistics in this section should be compared to each other and the intercept-only model (QICc = 207.00).

First, we added own height as a fixed factor, which showed that shorter participants kept more coins for themselves, Waldχ^2 = 7.83, *b* = −.174, *se* = .062, 95% CI [−.295, −.052], *p* = .005 (QICc = 202.82). Subsequently, opponent height was added to the model, which was marginally significantly related to percentage of coins kept for self in the DGs, Waldχ^2 = 2.81, *b* = .116, *se* = .069, 95% CI [−.020, .251], *p* = .094 (QICc = 202.15). This result indicates a trend in which participants kept a higher percentage of coins for themselves when faced with a taller opponent. Own height remained a significant predictor, controlling for opponent height, Waldχ^2 = 9.69, *b* = −.193, *se* = .062, 95% CI [−.315, −.072], *p* = .002. There was no significant interaction between own height and opponent height, Waldχ^2 = 0.38, *b* = .042, *se* = .068, 95% CI [−.091, .174], *p* = .540 (QICc = 203.85). Finally, we added relative height as a fixed effect to the intercept-only model, which showed that relatively shorter participants kept a higher percentage of coins to themselves in the DGs, Waldχ^2 = 9.33, *b* = −.202, *se* = .066, 95% CI [−.332, −.072], *p* = .002 (QICc = 200.67).

Discussion

Across three studies, we found preliminary support for the Napoleon complex—the idea that short men compensate behaviorally in dyadic intrasexual competitions with taller rivals, by behaving more indirectly aggressively in resource contests. The pilot study showed that feeling small, but not actual shorter height, was related to keeping more resources in an anonymous DG. These results were not replicated by the main studies, possibly because the actual presence of a taller opponent overruled the main effect of "feeling small." Studies 1 and 2 showed that (relatively) shorter men took more resources in a DG, suggesting that shorter males are more likely to adopt alternative competitive strategies such as indirect aggression. Study 2 also showed that (relatively) shorter men did not behave more directly physically aggressively in the hot sauce task, suggesting that shorter males are not more aggressive generally. In Study 1, opponent height did not affect resource allocation in the DG, but having a taller opponent was related to taking more resources in the DG (allocator has unconditional power) compared to the UG (allocator has conditional power, opponent can retaliate). Shorter men also kept more coins for themselves in the UG, but not when their opponent was taller than average—note that men who were relatively shorter than their opponent did not take more resources in the UG, this was only an effect of own height.

The results imply that own height is most important in predicting competitive behaviors in an absolute-power situation (the DG), regardless of opponent height. This is not surprising as shorter and taller men likely have different life experiences that may influence their decision-making in behavioral experiments. In our studies, we used (relative differences in) actual height as predictors, which can be seen as a strength of our method. Future research could use an experimental set-up—such as a virtual reality study—to manipulate experienced height differences independent of men's actual height. A limitation of our research is that we did not successfully measure an individual's physical strength—something we suggest for future research. The participants in Studies 1 and 2 faced their opponent, so other cues to formidability, such as muscularity (Sell et al., 2009), could have affected their decisions. Yet, regardless of potential differences in other body features, we still found an independent effect of height. Finally, although we assume that the UG is perceived by the allocator as involving a risk of physical retaliation, this assumption will need to be explicitly tested in future research. To our knowledge, this is the first study to examine the effect of height (differences) on men's behaviors in a (quasi-)experimental research paradigm. Beyond looking at physical strength, there are still a few questions to answer and possible future studies to conduct. For instance, with our current data we cannot clearly establish whether shorter men indeed are more indirectly aggressive, or simply less altruistic in same-sex encounters with taller rivals. The competitive version of the DG we used—taking money from the opponent—suggests an act of indirect aggression, however (Bardsley, 2008). Future research with alternative paradigms such as a helping task could study the influence of height in a noncompetitive setting. Additionally, a group situation could activate the Napoleon complex in different ways. There are alternative strategies to physical aggression, such as recruiting allies, gossiping, or even showing leadership to enhance one's social reputation. Furthermore, weapons or coalition size could compensate for short height (Fessler & Holbrook, 2013; Fessler et al., 2012). Finally, our current research focused entirely on intrasexual competition, but that is just one element of sexual selection theory. In terms of underlying mechanisms, the Napoleon complex may also be shaped by intersexual selection forces—shorter men could use behavioral strategies to impress females, such as risk-taking, generosity, or showing commitment (e.g., Griskevicius et al., 2007; Iredale, Van Vugt, & Dunbar, 2008). For further studies, it would be of great interest to add a potential mating opportunity to the paradigm to see how intersexual competition affects the Napoleon complex. The presence of an attractive female could exacerbate other kinds of overcompensating behaviors in short men—for example, an increased propensity toward risk-taking to impress women (e.g., Frankenhuis, Dotsch, Karremans, & Wigboldus, 2010).

In summary, our results are among the first to show that height differences matter in intrasexual competitions between men. Consistent with predictions from sexual selection theory, and in line with the Napoleon complex, short men kept more resources in competitive interactions, using height cues to assess the appropriateness of different behavioral tactics to take these resources from their male rivals. Further research could focus on the development of the Napoleon complex in men, perhaps using insights from life history theory.

Action Editor

Steven W. Gangestad served as action editor for this article.

Author Contributions

All authors contributed to the study concept and design, provided critical revisions, and approved the final manuscript. Data collection (coordination) was performed by N. M. Blaker and J. E. P. Knapen. J. E. P. Knapen drafted most of the introduction and discussion. N. M. Blaker performed most of the data analyses and drafted most of the method/results. J. E. P. Knapen and N. M. Blaker contributed equally and share first authorship.

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The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

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All data have been made publicly available via the Open Science Framework and can be accessed at https://osf.io/x9h8b/. The complete Open Practices Disclosure for this article can be found at http://journals.sagepub.com/doi/suppl/10.1177/0956797618760196. This article has received the badge for Open Data. More information about the Open Practices badges can be found at http://www.psychologicalscience.org/publications/badges.

Note

1. Napoleon was actually of average stature for his time (Lugli et al., 2007).

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