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## The Status-Size Association

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## Chapter 5

### The Napoleon Complex

*When shorter men act selfishly*

This Chapter is a collaborative effort with fellow PhD student Jill Knapen

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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)<sup>1</sup>. This story exemplifies the popular belief, known as the Napoleon complex, that men of short stature compensate behaviourally for a relative height disadvantage (note that despite the name, Napoleon Bonaparte was actually of average height for his time; Lugli et al., 2007). The origins of the Napoleon complex (or ‘short man syndrome’) are unclear, but have frequently been attributed to Adler’s (1956) inferiority complex theory, which assumes that people respond to feelings of inferiority on certain traits by overcompensating on others.

Is there a scientific basis for the Napoleon complex? Evolutionary psychology may offer a framework for understanding this phenomenon. Sexual selection theory suggests that an individual’s physiology and psychology have been shaped by the joint forces of inter-sexual and intra-sexual competition (e.g., Buss & Schmitt, 1993; Puts, 2010). Male height has been argued to be in part a product of both selection forces as being tall increases the ability to attract a potential mate (e.g. Nettle, 2002; Stulp, Buunk, & Pollet, 2013) and benefits men in intra-sexual competitions (e.g. Carrier, 2011). Intra-sexual selection occurs (amongst others) on male characteristics that enable success in combat with other males, such as strength and size (Sell, Hone, & Pound, 2012). We therefore expect the Napoleon complex to predominantly be a phenomenon of physical intra-sexual competition between males (Puts, Apicella, & Cárdenas, 2012; Sell, Hone, & Pound, 2012).

### **Benefits of Male Tallness**

Taller men enjoy several advantages over shorter men, as they have a higher social standing (Gawley, Perks, & Curtis, 2009; Judge & Cable, 2004), and are typically healthier and better educated (e.g. Kanazawa & Reyniers, 2009; Silventoinen, Lahelma, & Rahkonen, 1999). Several studies, across different cultures, have found an association between having a relatively tall stature and holding a position of power (Bernard, 1928; Handwerker & Crosbie, 1982; Werner, 1982). Ellis (1994) concluded on the basis of 95 studies from preindustrial and industrial societies, that there is indeed a universal height-status relationship in humans. This association remains after controlling for potentially confounding factors like genetics,

nutrition, and intelligence (Case & Paxson, 2008; Ellis, 1994; Persico, Postlewaite, & Silverman, 2004; Silventoinen et al., 1999). People also feel taller when assigned to a high status position (Duguid & Goncalo, 2012), and tall people are seen as having higher status (Blaker et al., 2013; Jackson & Ervin, 1992). However, for women, the height-status association is often found to be either weaker or non-existing (e.g. Blaker et al., 2013; Gawley et al., 2009; Hamstra, 2014; Melamed, 1994).

Why does height benefit men? Height, as does strength, contributes to an individual's formidability – the ability to inflict cost on others –, increasing their competitive fighting ability (Enquist & Leimar, 1983; Fessler, Holbrook, & Snyder, 2012). This makes height a highly relevant trait in human competitions between males. For instance, height is positively related to actual male dominant behaviour in a sample of western males (Stulp, Buunk, Verhulst, & Pollet, 2015). However, it is unclear whether height or physical strength better predicts competitive ability. Archer & Thanzami (2007) showed that in a sample of young Indian men, height was a stronger predictor than strength for physical aggression and direct aggression, and was the only significant predictor for hostility. Sell et al. (2009) suggest that in a sample of US students, height also independently predicted perceived male fighting ability, but strength was an even stronger predictor. The current research focuses on testing the 'Napoleon complex' phenomenon, which specifically concerns the impact of height, not strength, on male-to-male interactions.

### **The Napoleon Complex Psychology**

We hypothesize that men have a flexible status psychology that allows them to calibrate their behaviour to opportunities in the environment for status enhancement (van Vugt & Tybur, 2014). Being shorter than a competitor should alter the pay-offs associated with various status-seeking strategies. In a dyadic competition over resources, the taller male will generally have the best odds of winning a physical contest, meaning that the shorter male would benefit from employing alternative strategies that maximize resource acquisition in those specific circumstances.

Our Napoleon complex hypothesis suggests that – recognizing a situation in which they are physically outcompeted – shorter males will have to rely more on behavioural

flexibility (being able to respond in different ways according to different situational requirements; Zaccaro, Gilbert, Thor, & Mumford, 1991). Taller males' behaviour will be less affected by the context because of their consistent physical advantage. For shorter males, this behavioural flexibility entails avoiding physical aggression and using more covert strategies to acquire resources. Furthermore, as the goal is to acquire resources and not to harm the competitor, we expect the behaviour to be instrumentally motivated (Anderson & Bushman, 2002). In the current study, we will refer to this behaviour that aims to covertly gain resources without the direct intention to (physically) harm the competitor as 'selfish behaviour'.

Based on the Napoleon complex, we predict that short men will extract more resources from their taller opponents than vice versa in competitive situations where they can avoid (physical) retaliation. We do not expect shorter men to consistently be more selfish, but expect them to act more selfishly toward relatively taller men under certain conditions in order to acquire resources by other means than physical competition. We expect the Napoleon complex psychology to be activated under the following conditions: (1) men are competing for resources intra-sexually; (2) shorter men are paired with taller rivals; (3) the height difference is salient and internalized; and (4) the costs of selfish behaviour are reasonably low – e.g., there is (a) anonymity and (b) no threat of retaliation.

## **Overview of Studies**

In three experimental studies, we examine how relative height influences behaviour in economic games, which mimic actual resource contests. A pilot study tests the effect of "feeling small" on allocation decisions in a one-shot anonymous Dictator game (DG) comparing men and women. We predict that men who feel small act more selfishly, and that feeling small matters more for male selfishness than for female selfishness. In Study 5.1, we focus on men only and examine the effect of overt versus covert competitions. We compare decisions in a DG (no retaliation possible) versus an Ultimatum game (UG; retaliation possible). We expect relatively short men to be more selfish in the DG, but not necessarily in the UG. Finally, in Study 5.2 we examine selfish behaviour in a DG (instrumental to resource acquisition) and in a so-called "hot sauce allocation" task – a measure of direct and overt

aggression (not instrumental to resource acquisition; Lieberman, Solomon, Greenberg, & McGregor, 1999).

## Pilot Study

### Method

Sixty participants, 43 women, took part in a study at the University of Groningen ( $M_{\text{age}} = 20.90$  years,  $SD_{\text{age}} = 2.18$  years). They were paid 2 Euros, plus what they decided to take home from the Dictator game. 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 gender. The main dependent measure was the amount of 1 Euro coins left behind for others in the Dictator Game ( $M = 2.68$ ,  $SD = 1.88$ ).

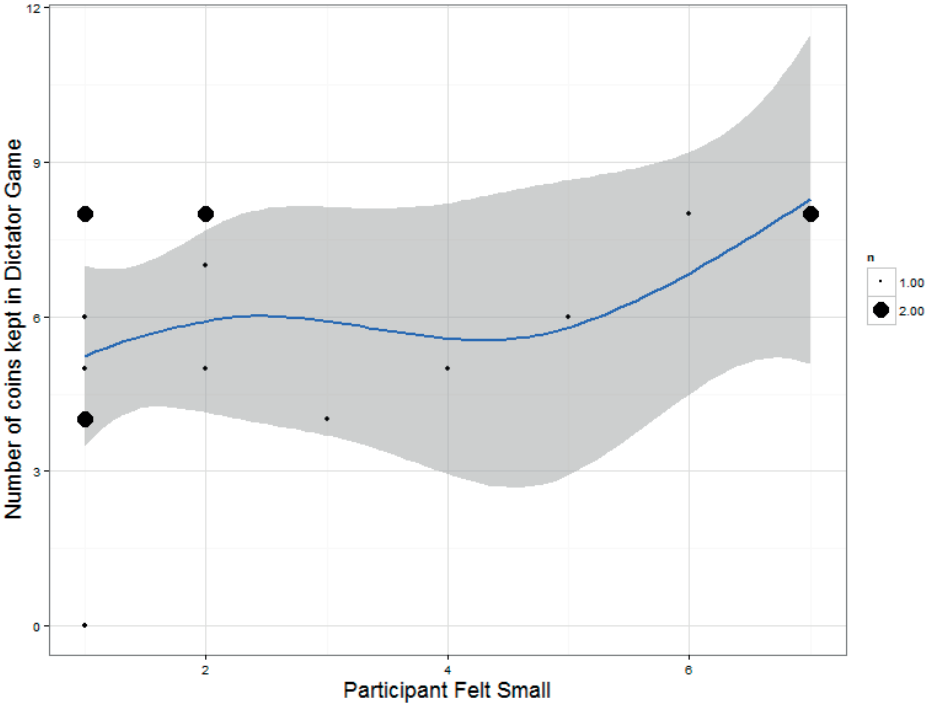
Participants were led into a cubicle, and read all instructions on paper. They completed a paper and pencil questionnaire with personality measures and socio-demographic questions including the measures on their height and read the instructions for the Dictator game. The money for the Dictator game was placed in coins in an envelope. Participants read in the instructions that the envelope contained eight one Euro 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 (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 e-mail.

### Results

We tested the effect of participant height (in centimeters) and feeling small on number of coins given away in the Dictator game, with a generalized linear model with a Poisson distribution (GzLM, corrected for overdispersion in IBM SPSS 21.0). Due to the modest correlation between absolute height and feeling small ( $r = .37$ ,  $p = .004$ ), 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 Dictator game ( $Wald\chi^2 = 3.99, p = .046$ ), while participant sex did not predict coin allocation,  $Wald\chi^2 = 0.36, p = .548$ . Furthermore, there was a significant interaction between participant sex and feeling small on coin allocation,  $Wald\chi^2 = 3.98, p = .046$ . Parameter estimates showed that feeling small led to a decrease in coins allocated to others for male participants,  $Wald\chi^2 = 4.46, B = -.281, p = .035$ , but not for female participants,  $Wald\chi^2 < 0.01, b < 0.01, p = .998$ . 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,  $B = -.281, 95\% \text{ CI of } -1.074 \text{ to } -.015, p = .046$ .



**Figure 5.1.** 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.



Absolute height in centimeters did not predict coin allocation,  $\text{Wald}\chi^2 < 0.01, p = .964$  (controlling for participant sex,  $\text{Wald}\chi^2 = 0.29, p = .590$ ). There was also no interaction between participant sex and absolute height on coin allocation in the Dictator game,  $\text{Wald}\chi^2 = 0.25, p = .620$ .

This first pilot study suggested that, in line with the Napoleon complex, feeling small significantly affected men's allocations in a Dictator game but not women's. There was no competitive context, and the Dictator game was played with an anonymous other. Therefore, in Study 5.1, we examine the effects of stature in a dyadic male-male competitive context, and manipulated the possibility of retaliation by the opponent. We are mostly concerned with height differences as predictors of behaviour, as a male can feel short or tall depending on whom he is competing over a given resource with. However, as it is also likely that absolute height matters (shorter and taller men will have had different life history experiences), we will also test whether absolute height or opponent height predict behaviour independently.

## Study 5.1

### Method

Forty-two male participants ( $M_{\text{age}} = 23.02$  years,  $SD_{\text{age}} = 2.98$  years;  $M_{\text{height}} = 182.98$  cm,  $SD_{\text{height}} = 6.79$  cm) completed the study at the Vrije Universiteit Amsterdam, in return for 5 Euros or course credits (excluding a bonus for playing economic games). Participants were paired up during the study (21 dyads; all pairs were strangers). The main independent variables were participants' relative height in centimeters (relative height = height of participant minus height of opponent), and participants' absolute height in centimeters. The main dependent variables were the amount of coins (out of 18) participants kept for themselves in a Dictator game ( $M = 12.62, SD = 4.05$ ), and the amount of coins (also out of 18) participants kept for themselves in an Ultimatum game ( $M = 10.24, SD = 1.91$ ). The "coins" 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 played a one-shot Dictator game (DG) followed by a

one-shot Ultimatum game (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 actually made these divisions. Participants were told their opponent would leave the lab separately, and they did not have to worry about a confrontation after the study ended. 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,  $\alpha = .62$ , as used in Griskevicius, Delton, Robertson, & Tybur, 2011). Finally, participants were debriefed and paid.

## Results

Because the relative height variable and the absolute height variable are not independent, separate analyses were performed for each variable. Absolute 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 behaviour in either economic game, we tested its robustness by repeating the analysis with 1) a bootstrapping procedure (1,000 resamples and a 95% CI, bias-corrected and accelerated), and 2) adding SES as a covariate.

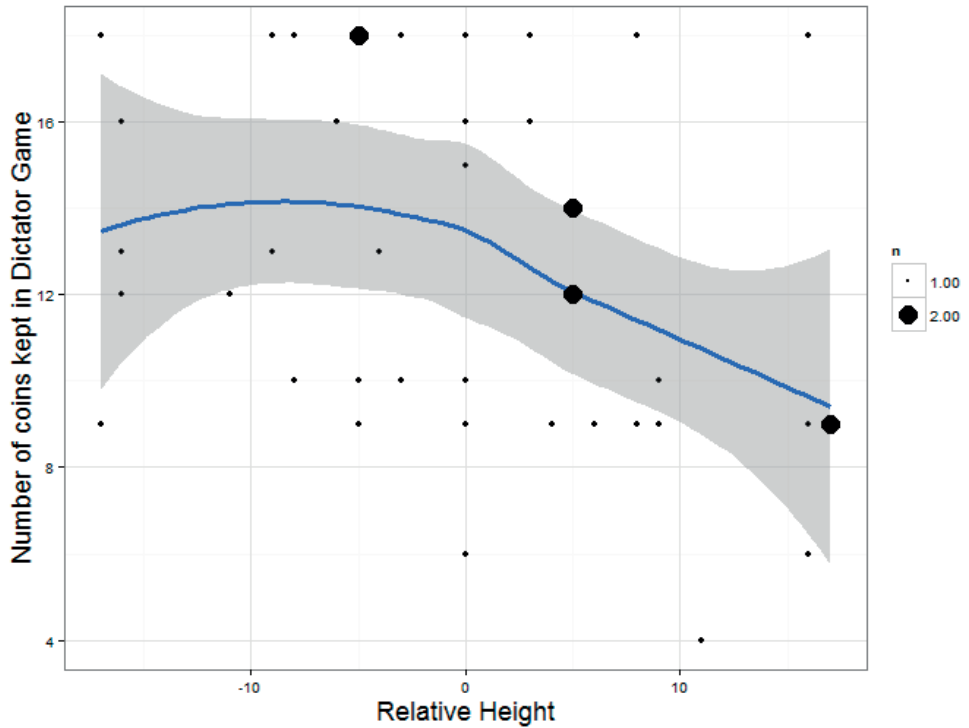
**Dictator game.** As expected, relative height had a significant negative effect on coins kept for self in the DG,  $\text{Wald}\chi^2 = 5.05$ ,  $B = -.011$ ,  $p = .025$ . The effect of relative height remains similar when bootstrapping is applied ( $B = -.011$ , 95% CI of  $-.20$  to  $-.003$ ,  $p = .053$ ), and when participant SES is controlled for,  $\text{Wald}\chi^2 = 4.58$ ,  $B = -.011$ ,  $p = .032$  (SES did not significantly affect the amount of coins kept for self,  $\text{Wald}\chi^2 = 0.11$ ,  $B = -.022$ ,  $p = .745$ ). The shorter the participant is compared to his opponent, the more coins he kept for himself. Figure 5.2 shows the data and the LOESS regression line of the effect of relative height on number of coins kept in the DG. Absolute height also had a significant negative effect on coins kept for self in the DG,  $\text{Wald}\chi^2 = 6.01$ ,  $B = -.014$ ,  $p = .014$ . This effect is upheld with

bootstrapping ( $B = -.014$ , 95% CI of  $-.27$  to  $-.004$ ,  $p = .026$ ), and when controlling for SES (Wald  $\chi^2 = 4.98$ ,  $B = -.014$ ,  $p = .026$ ). However, opponent height had no significant effect on coins kept for self in the DG, Wald  $\chi^2 = 1.23$ ,  $B = .008$ ,  $p = .267$ .

**Ultimatum game.** Of the 42 UG offers, 7 were rejected and 35 were accepted. As expected, there was no effect of relative height on coins kept for self during the UG, Wald  $\chi^2 = 0.24$ ,  $B = -.001$ ,  $p = .628$ . However, absolute participant height did have a marginally significant effect on coins kept for self in the UG, Wald  $\chi^2 = 3.39$ ,  $B = -.006$ ,  $p = .066$ , suggesting that shorter participants kept more coins for themselves. This effect remains similar when bootstrapping is applied ( $B = -.006$ , 95% CI of  $-.013$  to  $.001$ ,  $p = .090$ ), and when participant SES is controlled for, Wald  $\chi^2 = 4.57$ ,  $B = -.007$ ,  $p = .033$ . SES had no significant effect on coins kept for self in the UG, Wald  $\chi^2 = 1.10$ ,  $B = .045$ ,  $p = .295$ . Finally, opponent height had no effect on coins kept for self in the UG, Wald  $\chi^2 = .985$ ,  $B = -.004$ ,  $p = .321$ .

**Dictator vs. Ultimatum game.** To get an indication whether there is a significant effect of height on how the participants acted differentially 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 (coins kept in dictator game minus coins kept in ultimatum game; plus “7” to ensure all values in the data were above 0 as required for a Poisson model, as the lowest value was “-6”). The higher the score on this dependent variable, the more selfish the participant was in the DG compared with how they behaved in the UG.

Results showed that relative height predicted more selfish behaviour in the DG compared to the UG (Wald  $\chi^2 = 5.21$ ,  $B = -.014$ ,  $p = .022$ , with bootstrapping  $B = -.014$ ,  $p = .044$ , CI of  $-.026$  to  $-.002$ ). We found a marginally significant positive effect of absolute height (Wald  $\chi^2 = 3.51$ ,  $B = -.013$ ,  $p = .061$ , with bootstrapping  $B = -.013$ ,  $p = .089$ , CI of  $-.028$  to  $.000$ ), and a negative effect of approximately equal strength of opponent height (Wald  $\chi^2 = 3.29$ ,  $B = .015$ ,  $p = .070$ , with bootstrapping  $B = .015$ ,  $p = .106$ , CI of  $-.001$  to  $.031$ ). The shorter a participant was compared to his opponent, the more extra coins he kept in the DG (no cost to being selfish) compared to the UG (possible cost to being selfish).



**Figure 5.2.** 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 Relative Height in centimeters (height participant – height others) in Study 5.1.

As predicted by the Napoleon complex, relatively shorter men kept more coins for themselves in the Dictator game, but not in the Ultimatum game. Absolute height also predicted selfish behaviour in the two economic games in a similar way as relative height, whereas opponent height did not. Furthermore, relative height affected how participants acted in the two games differentially – relatively shorter men were more selfish in the Dictator game, compared to how they acted in the Ultimatum Game. In Study 5.2, we aim to replicate these results with a larger sample, and added a measure involving direct, overt aggression, the hot sauce task (Lieberman et al., 1999).

## Study 5.2

### Method

For Study 5.2 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 was collected in three waves – in April 2012, April 2013, and finally in April 2014. Participants ( $M_{\text{age}} = 22.02$  years,  $SD_{\text{age}} = 2.72$  years;  $M_{\text{height}} = 182.42$  cm,  $SD_{\text{height}} = 8.03$  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. Relative height in centimeters and absolute height in centimeters were the main independent variables. The main dependent variables were the amount of coins kept for self in the Dictator game (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 5.1, 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<sup>2</sup>), 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).

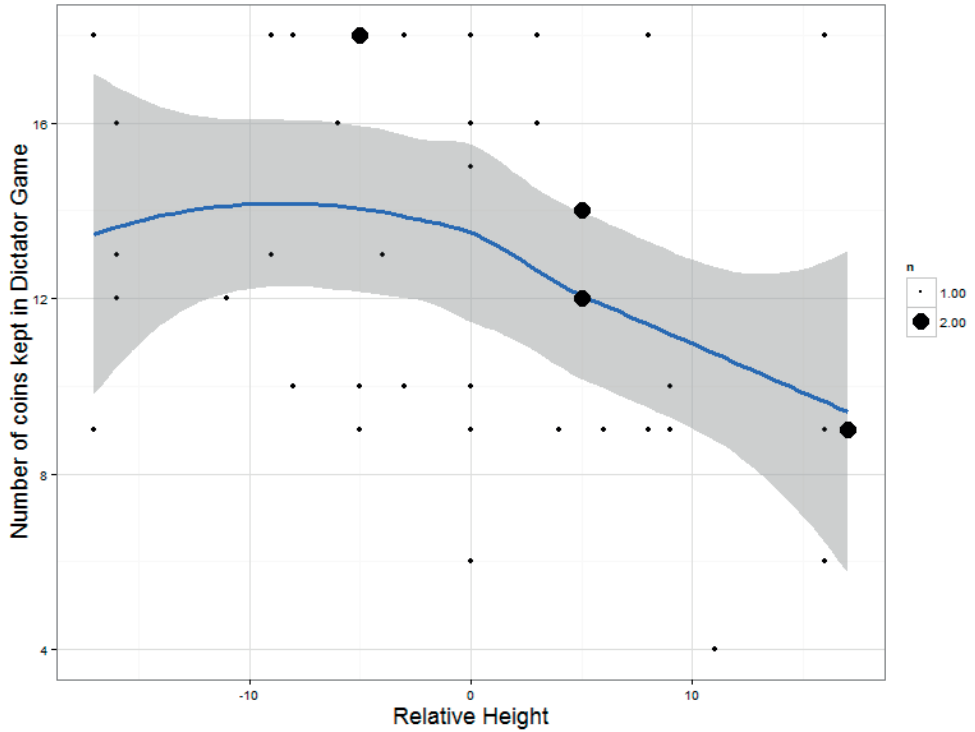
The procedure of the DG was identical to the DG in Study 5.1, except that participants now divided 15 coins (instead of 18). The “coins” in this DG were again poker chips worth €0.10 each. The hot sauce task was adapted from Lieberman et al. (1999). Participants were told this was a “taste test”, in which they would prepare a food sample for their opponent. Participants inserted (with a syringe) an amount of hot sauce between 0 and 5 milliliters into a

small cup of water for the opponent to drink. A larger amount of hot sauce indicates higher levels of aggression toward the other. The hot sauce paradigm was designed to be a measure of reactionary aggression; whilst participants gave the hot sauce in response to no particular action, the competitive atmosphere created (by being branded opponents) could create a similar effect (e.g. Adachi & Willoughby, 2011).

## Results

The same statistical approach as in Study 5.1 was used to analyze the data from Study 5.2 (GzLM with Poisson distribution, corrected for overdispersion). 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 behaviour in the DG or the hot sauce task, we tested its robustness by repeating the analysis with 1) a bootstrapping procedure (1,000 resamples and a 95% CI, bias-corrected and accelerated), and 2) adding participant ethnicity as a control variable.

**Dictator game.** In line with Study 5.1, relative height had a negative effect on the amount of coins kept for self in the DG,  $\text{Wald}\chi^2 = 5.79$ ,  $B = -.007$ ,  $p = .016$ . Participants who were shorter than their opponent thus kept more coins. Results were similar when applying a bootstrapping procedure ( $B = -.007$ , 95% CI of  $-.013$  to  $-.001$ ,  $p = .019$ ), and when controlling for participant ethnicity,  $\text{Wald}\chi^2 = 4.86$ ,  $B = -.006$ ,  $p = .027$ . There was no effect of ethnicity on coins kept for self in the DG,  $\text{Wald}\chi^2 = .58$ ,  $B = -.057$ ,  $p = .445$ . Figure 5.3 shows the data and the LOESS regression line of the effect of relative height on number of coins kept in the DG.



**Figure 5.3.** 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 Relative Height in centimeters (height participant – height others), in Study 5.2.

Furthermore, there was a negative effect of absolute height on number of coins kept for self in the DG,  $\text{Wald}\chi^2 = 5.20$ ,  $B = -.008$ ,  $p = .023$ . This effect was also upheld when applying a bootstrapping procedure ( $B = -.008$ , 95% CI of  $-.015$  to  $-.001$ ,  $p = .036$ ) and was marginally significant when controlling for ethnicity,  $\text{Wald}\chi^2 = 3.26$ ,  $B = -.007$ ,  $p = .071$ . Additionally, as in Study 5.1, there was no significant effect of opponent height on coins kept for self in the Dictator game,  $\text{Wald}\chi^2 = 0.58$ ,  $B = .003$ ,  $p = .448$ . Finally, unlike in the pilot study, the item feeling small did not influence behaviour in the Dictator game,  $\text{Wald}\chi^2 = 0.05$ ,  $B = .004$ ,  $p = .820$ .

**Hot sauce allocation task.** In order to analyze the hot sauce task in a consistent manner with the other dependent variables (i.e. with a Poisson distribution, or with the dependent variable as a count variable), we transformed the hot sauce scores by multiplying them by 10, in order to avoid decimals. So, for instance an original value of “4.2” (milliliters) becomes “42” (microliters).

No effect of relative height ( $\text{Wald}\chi^2 = 1.04, B = .005, p = .309$ ), absolute height ( $\text{Wald}\chi^2 = .106, B = -.002, p = .744$ ), opponent height ( $\text{Wald}\chi^2 = 2.21, B = -.010, p = .137$ ), or feeling small ( $\text{Wald}\chi^2 = .060, B = -.008, p = .806$ ) was found on amount of hot sauce administered to the opponent.

In accordance with the Napoleon complex hypothesis, a relative height disadvantage fostered selfish behaviour in a Dictator game, but not direct aggressive behaviour towards a rival in the hot sauce allocation task. Additionally, absolute height (but not opponent height) predicted selfish behaviour in the dictator game.

## Discussion

Across three studies we found preliminary support for the Napoleon complex – the idea that short men compensate behaviourally in intra-sexual competitions with taller rivals. Building on sexual selection theory, we hypothesized that men would use formidability cues to infer what strategy would be most profitable to extract resources in intra-sexual contests. Our pilot study showed that men, but not women, who “felt small” behaved more selfishly to acquire resources. However, this result was not replicated in Study 5.2. Possibly, the situational factors in Studies 5.1 and 5.2 (especially the actual presence of a taller opponent) overruled the effect of feeling small in general. Changing the item to “*I feel small compared to my opponent*” might have been a better option to measure feeling small in the presence of a specific opponent in Study 5.2.

Study 5.1 showed that shorter men competing with taller rivals acted more selfishly in a Dictator game, but not in an Ultimatum game. This suggests that shorter men show behavioural flexibility by taking more resources when there is no chance of (physical) retaliation, thus when the costs of aggression are low. Study 5.2 replicated this result and showed that short men did not act more physically aggressive. In line with predictions from



sexual selection theory, our research suggests that the “Napoleon complex” psychology is activated in shorter men when there is intra-sexual competition over resources between men who differ in height, and the costs of selfish behaviour are reasonably low.

While we found the predicted effects of relative height, the results in Study 5.1 and 5.2 also showed that absolute height similarly predicted selfish behaviour, yet opponent height did not. We expected relative height to be the main predictor of selfish behaviour, indicating that the Napoleon Complex is context sensitive. However, our results imply that absolute height is also important in predicting decisions in the experimental games. This is not surprising as shorter and taller men likely have different life experiences that may influence behaviour in lab studies. In our studies we used relative differences in actual height as predictors, which can be seen as a strong point of our method. Yet, this design prevents us from testing the independent influence of relative and absolute height. Future research could use an experimental set-up such as a virtual reality study to manipulate experienced height differences independent of people’s actual height.

A question that remains is whether shorter men indeed show more selfish behaviour or if they are simply less generous than their taller rivals. Even though the current data do not allow us to distinguish clearly between the two motivations, in our version of the Dictator game participants had the option to take money from their opponent (rather than give them money), suggesting an act of selfishness (Bardsley, 2008). Moreover, the instrumental component of the selfish behaviour, and the lack of height effects in directly aggressive behaviour in the hot sauce task, are in line with our expectations that shorter men are not less likely to be generous towards taller males in a non-competitive situation. Future research could study the influence of height in non-competitive settings.

One limitation of our research is that we did not measure an individual’s physical strength. Aside from height, other morphological cues could be used to assess an opponent’s formidability, such as facial dominance, muscularity, and face-to-width ratio (e.g. Sell et al., 2009; Valentine, Li, Penke, & Perrett, 2014). In Studies 5.1 and 5.2, participants briefly saw their opponent face-to-face, so other morphological features could have affected behaviour towards the opponent. Yet, regardless of potential differences in other body features, we still found an independent effect of relative height.

Our current research was based on intra-sexual competition between men. For further studies it would be of great interest to introduce a potential mating opportunity, and see how inter-sexual competition affects the Napoleon complex. Research shows that when a mating opportunity arises, men behave more dominantly towards each other (Ainsworth & Maner, 2012; Von Rueden, Gurven, & Kaplan, 2010). The presence of an attractive female could exacerbate other kinds of overcompensating behaviour in short men, for example an increased propensity towards risk-taking.

In summary, our results are among the first to show that height differences matter in intra-sexual competitions between men. Consistent with predictions from sexual selection theory and in line with the Napoleon complex, short men acted more selfishly in competitive interactions, using height cues to assess the appropriateness of different behavioural tactics to extract resources from their competitors. Further research could focus on the origins and development of the Napoleon complex, perhaps using insights from life history theory.

