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## The Status-Size Association

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## Chapter 6

### General Discussion



The goal of the research presented in this dissertation was to add a more nuanced insight into the previously existing findings on the relationship between human height and (proxies of) social status. Increased height or stature has been linked to status, power, and leadership in much previous research. These previous accounts have explained the relationship by (among others) the fact that height contributes to physical formidability and dominance (e.g. Murray & Schmitz, 2011), and the fact that height is related to cognitive ability (e.g. Case & Paxson, 2008). I have made an attempt to add to such explanations by separating status into dominance and prestige, and additionally investigating if muscularity – a different indicator of physical size and dominance – has a similar relationship to status as height does. Furthermore, I aimed to map the development of a status-size association, by looking at the effect across a range of age groups (6 to 17 years of age). Finally, whereas relationships between perceived height and perceived status have been widely researched, there is a surprising lack of research investigating the behavioural effects of stature. The goal of the final empirical chapter was to provide insight into how height can affect actual interactions. In this chapter I will give an overview and a discussion of the most important findings, discuss their implications, elaborate on the limitations of the current work, and present ideas for future research.

## **Overview of Findings**

### **The Height-Leadership Advantage in Men and Women**

In Chapter 2, I showed that taller individuals are seen as more leader-like than shorter individuals, though this effect differs somewhat for males and females. For a male target, height had a stronger positive influence on leader perceptions than for a female target. Furthermore, taller males were rated higher on leadership typicality because they were perceived as more dominant, more healthy, and more intelligent. On the other hand, taller females were only rated as more leader-like because they were seen as more intelligent than their shorter counterparts. I concluded that increased stature may be particularly beneficial for males, and that the explanation of a height-leadership advantage may differ between the sexes. These findings add to our understanding of Leader Categorization Theory and Implicit Leader Theory (Lord, DeVader, & Alliger, 1986; Lord & Maher, 1991), by showing that

taller stature is part of what people implicitly categorize as a typical leader. Additionally, Evolutionary Leadership Theory (van Vugt & Ahuja, 2010) suggests that such a categorization process (“if taller, then better leader”) may be partially the result of our evolutionary history – especially regarding the height-dominance association.

### **The Status-Size Association**

Chapter 3 investigated a status-size association by looking at two separate indicators of physical size, namely height and muscularity, and two separate strategies of gaining and maintaining status, namely dominance and prestige. In Study 3.1, results showed that a more highly ranked individual (a member of a political party) is expected to be taller than a lower ranked individual (an administrative political assistant). Whether the target had attained his status by means of dominance (force, intimidation) or prestige (admiration, free deference) made no difference – increased stature was thus associated equally with high dominance and high prestige. However, the high status dominance individual was rated marginally more muscular than the high status prestige individual, suggesting that muscularity may be associated more strongly with dominance than with prestige. Study 3.2 strengthened these results with a more abstract representation of rank and status – the low and high status individuals were differentiated by the relative amount of valuable resources they attained in a group, rather than by occupational status. In this case, the high dominance individual was rated significantly more muscular than the high prestige individual. Based on these findings, I conclude that height and muscularity may be related to status in different ways. Also, looking at status in terms of rank (low, high) *and* strategy (prestige, dominance) can lead to valuable new insights.

### **Development of the Status-Size Association**

In Chapter 4, I investigated the status-size association among children aged 6 to 12, and adolescents aged 12 to 17. Overall, increased height and muscularity was associated with high dominance-based status, as we saw among adults in Chapter 3. Additionally, there were some noticeable patterns of a changing status-size association as age increased, especially in the adolescent sample. In the sample of adolescents, the association between prestige and physical size increased with age, and was strongest in the older age groups (Grade 10 and 11).

Conversely, the association between dominance and physical size became weaker in the later Grades. Though these patterns were as expected, the sample of 6 to 12-year olds actually showed an unexpected *increasing* association between dominance and physical size – the older these children were, the more they expected highly dominant individuals to be larger. I expect that the different developmental patterns I found between the child and adolescent samples have less to do with age, and more with socioeconomic status (SES) – the elementary school where I collected data for Study 4.1 was situated in a low-income area, whereas the high school was located in a high-income area. The results in Chapter 4 build on previous evidence that infants (aged 10 to 13 months) already associate size with dominance (Thomsen, Frankenhuys, Ingold-Smith, & Carey, 2011).

### **Behavioural Effects of Height – The Napoleon Complex**

Whereas the first three empirical chapters focused on perceptions of status and size, Chapter 5 focused on behaviour. In collaboration with fellow PhD student Jill Knapen, I looked at competitive dyadic interactions between males, and investigated whether height affects interpersonal dominance, as measured by “selfish” behaviour in economic games. This research was inspired by the popular notion of the Napoleon Complex – the idea that shorter males are at a disadvantage status-wise, and attempt to compensate this by behaving more dominantly or aggressively. In a first pilot study, we showed that men (but not women) who indicated they “often felt small” kept more money for themselves in an anonymous dictator game. In Study 5.1 and Study 5.2, we tested whether relatively shorter males would take more money from a taller opponent in a one-shot Dictator Game. This was indeed the case, but only when there was no risk of retaliation from the taller opponent, and when the dominant behaviour was instrumental (i.e. resulted in the acquisition of resources). These results show that there are indeed behavioural effects of (relative) height under certain circumstances – not much attention has been paid to the behavioural effects of height, and these findings suggest it may be a fruitful area of future research. The results in Chapter 5 illustrate that we have to carefully consider the particular situation these behavioural effects of height are measured in. For instance, when there was no clear opponent present (pilot study), we found an effect of “feeling small” on behaviour but not of actual height. However, when there was a clear opponent present (Study 5.1 and 5.2) we found an effect of actual height but not of feeling

small in general. Having a clear rival may lead to different effects of height than when a rival is not directly present.

### **Implications**

Height has been recognized as a cue for status-related information for several decades, and multiple explanations have been proposed. Dannenmaier & Thumin (1964) and Wilson (1968) argued that physical height would be related to authority status as a function of perceptual distortion (i.e. things of higher value, need, or importance are perceived larger than they actually are), basing their hypothesis on previous experiments with objects such as coins (Bruner & Goodman, 1947) and food (Beams, 1954). More recently, it has been suggested that height's success in Western society has occurred thanks to certain advantages individuals of taller stature tend to have, for instance increased cognitive capacity and increased physical capacity (see Lundborg, Nysted, & Rooth, 2014). This approach focuses on the cognition and behaviour of the taller individual him or herself, rather than on how perceptions from others of that taller individual may facilitate status and leadership processes. Other research has focused on the association of height with physical formidability (e.g. Schmitz & Murray, 2011) – taller individuals are seen as more intimidating, imposing, and perhaps therefore can assert increased influence over others and move up the hierarchy (e.g. see Stulp, 2013).

Taken together, there are many possible reasons why height and status are associated. What do my current findings imply regarding *why* height is related to status? The results reported in this dissertation on a status-height association corroborate that there are indeed multiple reasons why it exists. I would argue that a main reason for height's relationship with status (and related concepts such as power and leadership) is through its association with two evolved strategies of status maintenance and gain – namely dominance and prestige (Henrich & Gil-White, 2011). On the one hand, taller individuals are (seen as) more physically formidable, which facilitates a dominance strategy of rank attainment. On the other hand, taller individuals are also seen as more intelligent and competent, perhaps facilitating gaining status through prestige processes. Taller individuals can benefit from increased perceived dominance as well as prestige, leading to an advantage in terms of rank and social status

attainment. In this dissertation I thus present an updated explanation of a status-height association by using the Dominance-Prestige Account of social rank (Cheng & Tracy, 2014).

One limitation of my experimental designs in Chapter 2 through Chapter 4, was that I measured estimations of height and muscularity as an estimation without a baseline comparison. This implies that I did not necessarily show that people have a *biased* perception of high status individuals; it can also imply that people are merely making educated guesses – after all, height and proxies of status are correlated in reality. This difference between a real perceptual bias (i.e. overestimating someone’s true height and muscularity) and merely making an educated guess about someone’s size based on experience is something which I have not teased apart in this current research, but is relevant in order to understand the status-size association better. For instance, it is possible that cues of dominance indeed lead to actual biased size perception (overestimating someone’s true size as a result of possible threat), but that prestige cues simply lead to taller estimations because people are making that guess based on experience.

If height’s association with status is indeed partially explained by physical formidability and perceived dominance, other cues of physical formidability should have similar results. Recent research has for instance already shown that facial width to height ratio – a cue for formidability (Zilioli et al., 2015) – is related to actual status attainment (Alrajih & Ward, 2014). In Chapter 3 and 4, I show that muscularity – a cross cultural cue for physical formidability (Sell et al., 2009) – is indeed also associated with high status (at least concerning men). Chapter 4 additionally shows that an association between dominance and muscularity is present from an early age, and persists throughout childhood and adolescence. Taken together, the results in this dissertation suggest that (male) muscularity is an interesting variable to consider for future social status research. The results in Chapter 4 additionally show how different a status-size association can be when the age of the perceiver is considered. The findings in this chapter imply that what is considered as “high status” by children and adolescents changes over time. Also, this chapter implies that the dominance-prestige account of social rank could be a valuable addition to developmental psychology research, as a complementary theoretical framework to the Resource Control Theory of social dominance (RCT, see Hawley, 2014).



Individuals can accurately gauge a target person's physical strength and fighting ability (e.g. their physical formidability or Resource Holding Potential; Parker, 1974) from their height and muscularity – this is argued to be an evolved adaptation for decision making with regard to physical conflict, i.e. when to defer or retreat, and when to display or fight (Sell et al., 2009; Sell, Hone, & Pound, 2012). Previous research has shown that a target male's conceptualized "size" (corresponding to height in this dissertation) and "strength" (corresponding to muscularity in this dissertation) increase as a result of implied threat. For instance, males are estimated to be taller and more muscular when they are carrying dangerous weapons (Fessler, Holbrook, & Snyder, 2012), the perceiver is less physically strong (Fessler, Holbrook, & Gervais, 2014), or the perceiver cannot defend themselves because of physical restriction (Fessler & Holbrook, 2013a). Conversely, having allies present (who could help physically defend) decreases estimated height and muscularity of a potential opponent (Fessler & Holbrook, 2013b). Findings from Chapter 3 and 4 of the current dissertation add support to this line of reasoning, as I show that a person who is described as highly dominant (i.e. uses force and threat to gain status) is also estimated taller and more muscular. Furthermore, my findings imply that this threat-size effect occurs at least from the age of 6, and persists into adulthood.

Finally, Chapter 5 showed how height can shape interpersonal dominance in a contest situation between two men. Though there has been much research on height and status in terms of perception, behavioural research has been relatively rare. Stulp, Buunk, Verhulst, and Pollet (2015) showed that in a natural encounter between two same-sex individuals where one person would have to yield, the taller individual was less likely to yield than the shorter individual. Also, taller referees give fewer fouls during FIFA football matches, suggesting that they have more authority on the field than shorter referees (Stulp, Buunk, Verhulst, & Pollet, 2012). Chapter 5 shows that the expected pattern of "taller male acts more dominantly" can be reversed under certain conditions. Though we mainly expected to find an effect of relative height (the difference between yourself and an opponent), we actually also found effects of absolute height on dominant behaviour in a dictator game in two studies – we did not find any significant effects for opponent height. Own height is thus likely a stronger predictor of interpersonal dominance than opponent height.

## **Limitations and Future Research**

Though the studies reported in this dissertation were conducted with great care, some limitations should be highlighted. First, in Chapter 2, I concluded that height is more beneficial for men in terms of leadership than for women. However, the conditions were not counterbalanced which compromised the internal validity of the experiment – participants always evaluated the male target first, and the female target second. The woman was thus always evaluated in comparison to the man, but the man was never evaluated in comparison to the woman. Though there are sound theoretical arguments to be made that height should indeed be more beneficial for men than women, this order of measurement may have strengthened the difference. Follow up studies are necessary to learn how robust the effect is, whether the effect only happens when women are evaluated in comparison to men, and whether this gender difference also occurs outside a business context.

This dissertation looked at the association between different aspects of size (height, muscularity) and of status (dominance, prestige) – I investigated how these elements of status and size influenced each other. However, one particular aspect of a status-size association has not been investigated in this work, namely how cues of muscularity influence perceptions of dominance and prestige. Whether muscularity leads to prestige is a relatively unexplored question. As reported in Chapter 3, adults do expect highly prestigious males to have more muscle mass when directly asked, but this does not necessarily imply that the reverse is also true. For instance, being confronted by a muscular individual may elicit associations of aggression and threat (relating to dominance) more readily than associations of attractiveness and prestige, causing the former to “override” the latter when making quick judgements. Specific circumstances (based on individual differences and environmental cues) will likely dictate whether a muscular individual will be associated with high prestige.

All findings in this dissertation are based on samples from Western Industrialized nations (the Netherlands and the U.S), which reflects the overwhelming majority of research published in psychology journals (Arnett, 2008). The almost exclusive use of so-called WEIRD participants (Western, educated, industrialized, rich, and democratic) is argued to constrain the conclusions researchers can draw about human psychology in general (Henrich, Heine, & Norenzayan, 2013). This may especially be an issue when researching aspects of

human psychology which are generally accepted as “universal” – such as processes related to hierarchy and status, which are the focus of this dissertation. Whereas findings relating physical size to dominance may be expected cross-culturally (for instance, see Undurraga et al., 2012; Sell et al., 2009), I expect associations with prestige to be more flexible. For instance, in societies where physical formidability is more of an asset to daily life (because of a pressing need for physical work, or a high occurrence of physical contests) such as in hunter-gatherer tribes, muscularity may be equally strongly associated with prestige and dominance. As another example, individuals may only attribute prestige to taller individuals if they are exposed to an environment where inequality has caused a strong association between socio-economic status and height (and a relatively high variation in height), like in most Western industrialized societies. This hypothesis could be tested in a fairly straightforward manner – I would expect to find that in populations with more variation in height there would be a stronger relationship between height and prestige-based status. Also, I would expect to find a positive correlation between indicators of a population’s inequality (measured by for instance the Gini coefficient, as used in Brooks et al., 2011), and the variation of height in that population. However, we should be careful to draw individual conclusions on the basis of country-level data, as has recently been argued (Pollet, Tybur, Frankenhuys, & Rickard, 2014).

By only discussing height and muscularity as indicators of physical size, I have currently ignored a third important size cue, namely amount of body fat. In the current dissertation I excluded this size cue because I focused on something height and muscularity have in common, but does not necessarily apply to body fat – height and muscularity are a proxy of physical formidability and therefore predict future resource attainment, while body fat is a reflection of past food intake but does not necessarily predict future Resource Holding Potential. The amount of body fat is a direct outcome of the amount of food taken in and therefore is indicative of access to food in a resource rich environment – by this logic body fat could possibly be a signal of high status. However, in industrialized societies where calorie-rich food is relatively abundant and easy to access, excess body fat has actually become associated with lower status – obesity is negatively related to socioeconomic status in high-income societies. On the other hand, in low and middle income countries, obesity tends to be positively related to socioeconomic status (for a review on this topic, see McLaren, 2007). It

would be interesting to see whether body fat also leads to different perceptions of status across those different populations.

I have already briefly touched on how the environment can influence how size and status are related to each other, and may be likely most strongly related when physical conflict is present (for instance during war). However, there could be additional situations where we show an adaptive response by preferring bigger, stronger leaders. First, I would like to find out whether competition in general already elicits an association between prestige and muscularity, or whether an element of specifically *physical* competition needs to be present. If competition in general elicits the same response, this would have implications for corporations which operate in a very competitive environment, though not characterized by physical conflict. Another example of a context which may influence how perceptions of status and muscularity relate to each other is an environment exhibiting cues of resource scarcity, as for instance in the current economic crisis. In the face of scarcity and uncertainty humans show an adaptive response in terms of mate choice (Little, Cohen, Jones, Belsky, 2007); an adaptive response to such environmental conditions could also be expected in terms of status and leadership perceptions and preferences. Perhaps a perception of threat in general (be it from resource scarcity or physical conflict) increases the preference for a more formidable leader.

Results from my studies showed that people tend to attribute increased height to high status individuals regardless of which strategy that high status person used to obtain his position, but that muscularity is attributed more to those who use a dominance-based strategy rather than a prestige-based strategy. To test whether this effect exists outside the carefully controlled lab experiments, size perceptions of existing leaders who use fear and intimidation to rule (for instance, dictators) versus existing democratically elected leaders could be compared. If the same mechanism is at work in this applied case, I should expect that both types of leaders are estimated taller than the general public and as equally tall compared to each other, but that the dictator will additionally be estimated more muscular than the democratic leader. There are several other possible avenues of research. For instance, are leaders in certain traditional societies – who are often referred to as “Big Men” – really physically bigger than their followers? There have been suggestions this is the case (e.g. Sahlins, 1963; Ellis, 1992 ), but systematic data is scarce or non-existent. Also, is the

disproportionate representation of Caucasian males in leadership positions partially due to the fact they are on average taller than other sub-populations in the U.S. and other Western countries? Although undoubtedly more powerful forces are at play which propagate this phenomenon, it is likely not helpful to women and ethnic minorities that they tend to be shorter on average than their Caucasian male counterparts.

### **Conclusion**

This dissertation focused on the relationship between different status attainment strategies (dominance, prestige) and different aspects of physical size (height, muscularity), referred to here as the status-size association. First, I showed that taller men and women are perceived to be more leader-like, for different reasons. Taller men are seen as leaders because of their perceived dominance, health, and intelligence. Taller women on the other hand were only seen as leaders because of their perceived intelligence. Aspects of formidability such as dominance are thus more important for the perception of male leaders, and height is likely more advantageous for male leaders than for female leaders. Vice versa, higher status men are also expected to be taller than lower status men – this happens regardless of *how* he chooses to climb the ranks, either by force (dominance) or competence (prestige). Not only estimated height is affected by status, as higher status men are also perceived to be more muscular. Unlike height, muscularity estimations are more affected by implied dominance than by prestige. Furthermore, the status-size association changes throughout childhood and adolescence. In general, the data shows an increasingly strong association between prestige and size (both height and muscularity) during adolescence. Finally, height affects dyadic interactions between men in a contest situation. Under the right conditions (interpersonal contest over resources, no retaliation possible, height differences are salient) the shorter male acts more dominantly toward the taller male by taking more money in a Dictator Game. Taken together, the results in this dissertation show that size matters when it comes to person perception and interpersonal behaviour.



